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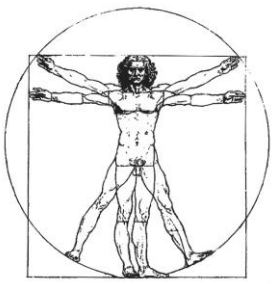

ecbi policy report

# REDD:
## The role of land use and forestry in mitigation

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REDD: the Role of land use and forestry in mitigation



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## Executive Summary

This briefing was initially prepared in advance of the European Capacity Building Initiative (ecbi) workshops for Francophone and Anglophone Africa which were held respectively in Dakar, Senegal (21 to 23 July 2009) and Addis Ababa, Ethiopia (18 to 20 August 2009). It was later updated to reflect feedback from the above workshops.

Tropical deforestation accounts for around 20% of global greenhouse gas emissions. Without measures to reduce the rate of deforestation in developing countries, it will continue to increase. The climate change conference held in Copenhagen in December will agree on a post-2012 climate regime which will include a mechanism to reduce emissions from deforestation and forest degradation (REDD). This briefing paper will deal with a number of the policy issues that negotiators will need to consider when negotiating the policy approaches and positive incentives for REDD as well as the complex scientific, technological, methodological issues.

If designed well, a REDD mechanism will have many benefits not only for reducing greenhouse gas emissions, but for biodiversity protection, safeguarding the rights of indigenous people and local communities as well providing other environmental services. However, a number of key issues will need to be addressed to deliver an effective mechanism. These include: ensuring adequate financing will be delivered to those that need it including indigenous people and local communities; meeting the long-term climate goals; addressing the drivers of deforestation in different regions and countries; ensuring real reductions in deforestation and forest degradation than those that would otherwise have occurred (additionality), ensuring that the mechanism does not lead to forests being cut down in other areas or other countries (national and international leakage) or are not permanent; and ensuring that countries have the institutional and governance frameworks in place to monitor, report and verify emission reductions.

Support is needed to finance capacity building and technology transfer to enable developing countries to address these issues and implement an effective mechanism for REDD. This will be essential to deliver on the dual objectives of reducing greenhouse gas emissions and protecting biodiversity as well as safeguarding the environmental integrity of any future climate change agreement.

# 1 Introduction

Tropical deforestation accounts for around 20% of global greenhouse gas emissions (GHG). Neither the United Nations Convention on Climate Change (UNFCCC) nor the Kyoto Protocol contains any specific obligations for limiting deforestation in developing countries, although Article 4.1 of the Convention places a general obligation on all Parties in this respect[1]. A mechanism to reduce emissions from deforestation and forest degradation has the potential to achieve a number of benefits both in reducing greenhouse emissions as well as protecting biodiversity, improving governance and ensuring the participation of indigenous people and local communities.

In 2005, Papua New Guinea and Costa Rica presented a proposal to the 11th Conference of Parties (COP11) in Montreal to consider policy approaches and positive incentives to reduce emissions from deforestation (REDD) under the UNFCCC. Parties welcomed the discussion and decided on a two- year process to provide a recommendation by COP13. A number of workshops were held to discuss the key scientific, methodological and policy issues and submissions were prepared from Parties and Observers to support this process (see Annex 1 for decisions and submissions on REDD).

In COP13 in Bali, a mandate was established to continue discussions on the methodological issues under the Subsidiary Body for Scientific and Technological Advice (SBSTA) and to discuss "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"[2] under the Bali Action Plan and its Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA).

The Copenhagen climate change conference (COP 15) to be held at the end of the year, is expected to agree on a package of outcomes which will include developing countries mitigation action. The policy approaches for REDD are being considered under the mitigation building block of the Bali Action Plan. What the architecture of the REDD mechanism will look like, is as yet unclear. Furthermore, provisions for financing, technology transfer, capacity building and institutional frameworks for REDD will also need to be considered. The methodological issues will continue to be discussed under the SBSTA and this process is already advanced. However, questions are being asked about what to negotiate first: the policy approaches or the methodological issues? Some Parties want to discuss the policy issues before the methodological issues whilst others believe that methodological discussions need to continue under the SBSTA. At the 5th session of the AWG-LCA in Bonn in March 2009, the AWG-LCA Chair stated his views on how REDD will be negotiated, in that it would be similar to the Clean Development Mechanism (CDM), where the main components of the mechanism were included in the protocol text and the modalities and procedures were negotiated afterwards. What is clear is that many Parties agree that a mechanism should be developed, but the key components of that mechanism are still under discussion.

**Reducing emissions from deforestation and forest degradation in Africa**

Land use change emissions come almost exclusively from deforestation in tropical countries with an estimated 41% from South and Central America, 43% from South and

Southeast Asia, and 17% from Africa[3]. African countries have relatively low deforestation and high forest cover.

Actions to reduce emissions from deforestation and forest degradation will also have an impact on the adaptation strategies of developing countries, which is a key issue for many African countries. Adaptation strategies will need to be developed for natural systems, which provide ecosystem services that ultimately underpin human well-being. Strategies are needed to enhance resilience in forest ecosystems in the face of climate change and may require a new paradigm for nature conservation to address the impacts of climate change, concentrating primarily on well functioning ecosystems.

This briefing paper explores the policy and methodological issues related to reducing emissions from deforestation and forest degradation. Establishing a mechanism for REDD will have many benefits not only for reducing greenhouse gas emissions, but for biodiversity protection as well. Delivering on both of these objectives as well as addressing the number of complex scientific, technological, methodological, financial and equity issues will be essential for a successful Copenhagen outcome.

## 2 Main policy issues

There are a number of policy issues which are currently being discussed in the AWG-LCA. These include: the scope of a REDD Mechanism; the financing source or positive incentives; the architecture issues; the scale of emission reductions; how to safeguard the rights of indigenous peoples and local communities; and the drivers of deforestation. There are two broad categories of policy problems to be considered in negotiating a mechanism to reduce emissions from deforestation and forest degradation:

(i) ***Reducing and halting active deforestation and hence emissions***. This lends itself to treating deforestation as an emissions problem and directly connecting it in some way to the UNFCCC and Kyoto Protocol emission control architecture in order to provide the incentives needed to reduce emissions.

(ii) ***Protection of existing forests***. In this case forests are protected but local authorities struggle with insufficient resources or capacity to adequately safeguard them and to provide incentives for their maintenance. Although this does not lend itself to an emissions approach due to problems with establishing baselines, it is nevertheless an important issue.

The scope of the discussion on reducing emissions from deforestation is becoming much broader as countries vie to have their interests included in any mechanism developed. The focus of negotiations initially started simply on reducing emissions from deforestation (RED). In Bali, Parties included forest degradation, as it was noted that degradation was often a precursor to deforestation and more of an issue in some countries (particularly in Africa). REDD was thus introduced. Parties with standing stocks or reforestation projects such as India and China, supported consideration of the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in the negotiations on REDD. However, the Bali Action Plan separates these issues (as these latter issues deal with removals or forest sinks) from the former (deforestation and forest degradation) which deal with reducing emissions. In the AWG-LCA discussions, these issues are all labelled as REDD-plus (REDD+). However, there may need to be

some separation of these issues due to the fact that REDD is about reducing emissions whilst REDD+ focuses on providing incentives for removing carbon dioxide from the atmosphere (otherwise known as removals).

The implications of the effectiveness of a REDD mechanism which includes conservation, sustainable management of forests and enhancement of carbon stocks will need to be considered. For example, countries that have large carbon sinks or plans to enlarge their carbon sink capacity could offset their emissions from deforestation and thereby the rate of deforestation would not be reduced. There are a number of difficulties that may arise in negotiating a broader scope for REDD which includes the REDD+ activities such as: establishing definitions; measuring, reporting and verifying REDD+ actions; establishing accounting rules for reductions from baselines; and how to ensure incentives are provided to achieve real reductions from deforestation and forest degradation.

Furthermore, the United States of America (USA) has proposed that REDD should be considered broader as a full land sector approach. There are a number of concerns with a broader land sector approach such as moving away from a focus on simply reducing emissions from deforestation and diluting the incentives for REDD; requiring emissions accounting for more activities than is even now possible in developing countries; increasing the cost of monitoring, reporting and verification in developing countries; and increasing the risk of perverse incentives if deforestation emissions were offset through accounting emission removals from other land use activities.

Other terminology often used within the climate negotiations around forests is Land Use, Land Use Change and Forestry (LULUCF) and AFOLU which refers to Agriculture, Forestry and Other Land Uses. These are distinguished from REDD because they relate to the current Annex I accounting rules and proposed rules for the second commitment period respectively. AFOLU has been used because of the most recent IPCC 2006 Greenhouse Gas Inventory Guidelines which merged the Agriculture and LULUCF components together. These guidelines have not yet been adopted by Parties as they are still considering whether or not to use them. The table below shows the different terminology and what they are used to describe.

Table 1: Terminology used within the UNFCCC negotiations on forests.

| **Terminology** | **Includes:** |
|---|---|
| RED | Deforestation |
| REDD | Deforestation and Forest Degradation |
| REDD-Plus | Conservation<br>Sustainable Management of Forests<br>Enhancement of Forest Carbon Stocks |
| Land-sector | Entire land use sector, could also include agriculture (very similar to AFOLU or LULUCF see below) |
| LULUCF (Land Use, Land Use Change and Forestry) | Afforestation and Reforestation<br>Deforestation<br>Forest Management<br>Cropland Management<br>Grazing Land Management |

| | |
|---|---|
| | Revegetation |
| AFOLU (Agriculture, Forestry and Other Land Uses) | LULUCF (see above)<br>Agriculture<br>This could also include wetlands and peatland management. |

## 2.1 Financing

Reliable financing is needed for all developing countries in which tropical deforestation occurs. Estimates of the volume of funding required to significantly reduce deforestation vary by region and with the economic accounting framework used and contains significant uncertainties. Many reports identify a range of estimates from US$2bn/year to US$33bn/year. For example research carried out for the Stern Review indicates that the opportunity cost[4] of forest protection in 8 countries responsible for 70% of emissions from land use could be around US$5bn/year initially[5], although over time these costs would rise. A review on financing global forests in the United Kingdom (Eliasch Review) found that the opportunity costs for halving deforestation by 2030 are US$17-33bn/year and the capacity building needs for 40 countries would cost US$4bn over 5 years[6]. The UNFCCC financial flows report prepared in 2007 estimated the indicative cost of reducing deforestation and forest degradation in non-Annex I Parties to zero in 2030 at around US$12bn. However, it must be noted that the standard of citing opportunity costs often omits consideration of important land-use decision-making and ongoing maintenance costs.

There are a number of issues on financing that need to be considered including: what type of financial mechanism will be agreed; the length of time financing is needed in developing countries; what type of unilateral action developing countries will do; if funding programs have already provided financing for reducing deforestation in developing countries are there double-counting issues to consider; and how the support will be measured, reported and verified. Furthermore, because there are so many interests in accessing to financing within the broader climate negotiations, such as for adaptation, insurance and compensation mechanisms, developing countries mitigation, technology transfer and capacity building, the financial package to be determined in Copenhagen will need to consider how all of these activities are financed.

During the negotiations, Parties have been proposed a variety of financial mechanism such as: auctioning of Annex I allowances to fund both adaptation and REDD activities (Norway, Tuvalu, supported by Panama, Paraguay and El Salvador); funds (Brazil); carbon markets (Coalition for Rainforest Nations, US, Australia and New Zealand); a funding mechanism raised through a levy of 0.5% to 1% of the GNP of Annex I Parties (Bolivia); community trust funds and levies on international bunker fuels (Tuvalu); and a Global Forest Carbon Mechanism (European Union). Countries are also considering a phased approach for financing with variations of each of these financing options to fund certain activities such as: a carbon market for REDD and funds for REDD+ activities (India and Mexico) or a readiness fund for countries to strengthen their capacity initially (Coalition for Rainforest Nations and US). These financing options are discussed in more detail below.

**Funds**

A system based on incentives can be relatively simple to design and implement. Funds can be used to develop capacity building in countries and institutional frameworks. Funds could provide direct support in countries for proper land management to strengthen government control capacity, to develop new conservation measures and economic alternatives to logging.

However, there are also concerns with regard to this financing option. Voluntary contributions of public funds could be limited (or non-additional) and unlikely to provide the resources needed for a problem of this size. Developed countries may not wish to contribute to a fund if they perceive they will obtain nothing in return. Such funds may need to be linked to some other commitments from developed countries. A robust monitoring system would be necessary to ensure developing countries receiving the funds, use such funds effectively and implement policies and actions for reducing emissions.

**Carbon Markets**

Carbon markets provide an incentive to both buyers and sellers of credits to maximise the scale of emissions reduction activities, while using the resources provided by the market in the most efficient way. However, the threshold on minimum essential institutional requirements, governance and robust measuring, reporting and verification (MRV) requirements for a developing country to participate would need to be much higher than a fund. Access to a trading system on a fully fungible basis, that is, a credit from reducing deforestation by 1 tonne $CO_2$ is equal to an emission allowance of 1 tonne $CO_2$ by a developed country, would require high levels of MRV standards and could also imply developing countries would have to adhere to a binding compliance system. This could raise equity concerns for many African countries, as lack of capacity and the means to participate in a market system are greater.

A carbon market for REDD is unlikely to be feasible in the near future due to these necessary requirements being ready in all developing countries. The risk of international leakage is therefore much greater with a carbon market. Furthermore, a carbon market is unlikely to provide the necessary financing for countries to develop their institutional and technical capabilities. Expectations around the demand for reduced deforestation credits from Africa need to be examined, particularly in light of experience of the failure of the Clean Development Mechanism (CDM) to generate many projects in African countries. Some countries such as Brazil, Tuvalu and Bolivia, have also expressed concern about the use of offsetting through a carbon market and achieving the greenhouse reduction goals to avoid dangerous climate change. There is a risk that if emission targets are not deep enough or REDD is not additional, then the chance of exceeding $2^oC$ is greater. For example, Nicaragua, Guatemala, Dominican Republic and Honduras have stated REDD actions must be additional and not directly linked to the commitments by developed country Parties. Issues of concern include:

(i) If requirements for deforestation credits were less than those for the other types of credits in the trading system, they would destabilize the carbon market by 'flooding the market' with cheap credits, thus undermining its environmental integrity.

(ii) Once a forest enters the system and credits are obtained then there would be a disincentive to deforest that land. If any carbon is released it would have to be replaced by the developing country host, presumably at the prevailing market price at the time of release, and could increase a country's financial liabilities.
(iii) If the compliance system is weak or the economic value of alternative uses of the forested land rises sufficiently it could be economically efficient to cut down forests previously protected (and for which carbon credits have been obtained and sold) and simply purchase replacement credits. This would undermine the original purpose of the system unless there are agreed rules in place to hinder or prevent this.

**Hybrid alternatives**

Hybrid alternatives of a fund and market approach also exist. These are market-linked but not market-driven. For example, the Norwegian proposal for a financial mechanism is based on auctioning of the assigned amount units from Annex I Parties. Financing would be generated by developed countries meeting a fraction of their targets through an auction. These funds could then be distributed to developing countries for a variety of actions including: adaptation, mitigation and REDD. A number of Parties support the idea of auctioning such as the European Union and Tuvalu. Some studies have found that assuming a carbon price of €20/t CO2-equ for example, a 2% REDD target from a 1990 base year would yield €9 billion/year[7]. Concerns with this approach include whether or not governments would accept auctioning at the international level and how the money is distributed: to an international institution such as the UNFCCC secretariat or bilaterally.

**Current Financing**

There are currently a number of financing options already available for many countries for forest protection. This includes the World Bank Forest Carbon Partnership Facility (FCPF) established in June 2008, currently US$300 million is available to fund activities to reduce deforestation and forest degradation. There are 37 countries receiving funding under the WB FCPF Readiness Mechanism with 5 countries expected to participate in the Carbon Finance Mechanism. There are 13 countries from Africa participating in the Readiness Mechanism including: Liberia, Ghana, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo, Uganda, Tanzania, Kenya, Ethiopia, Mozambique and Madagascar[8]. Other World Bank projects such as the Forest Investment Program and BioCarbon Fund also provide funding for forests[i].

The UN-REDD programme established in June 2008 by the UNDP, UNEP and FAO and working in collaboration with the World Bank's FCPF is also raising money for REDD readiness. So far 9 projects have been selected in three regions[9] in phase one of the programme. The DRC and Tanzania are receiving US$1.88 million over 1 year and US$4.2 million over 2 years respectively for REDD activities. Other international organisations such as the International Tropical Timber Organization (ITTO) provides

[i] World Bank Carbon Funds and Facilities website:
http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCARBONFINANCE/0,,menuPK:4125909~pagePK:64168427~piPK:64168435~theSitePK:4125853,00.html

around US$16 million a year for Sustainable Forest Management. A number of bilateral initiatives from countries also provide international financing these include:

- The Australian International Forest Carbon Initiative, AUS$200 million over 5 years. The project is working mainly with Indonesia and Papua New Guinea and is working on monitoring and establishing a carbon market mechanism for REDD.
- The Norwegian Climate and Forest Initiative, NOK3 billion a year to promote conservation for all types of tropical forests. Norway is funding other multilateral projects as well as NOK100 million in Tanzania.
- German funding of EUR500 million from 2009-2012 to protect forests and other habitats.
- The UK has put forward £50 million along with the Norwegian government into the Congo Basin Fund.

## 2.2 Architecture of a REDD Mechanism

There are a number of architectural options for how REDD could fit into the Copenhagen agreement. REDD could be considered either as a separate mechanism or as an activity under a developing country's Nationally Appropriate Mitigation Actions[10] (NAMA). Furthermore, a few Parties (Australia, New Zealand and Papua New Guinea) have proposed amendments to the Kyoto Protocol to include REDD+ as a market mechanism. This will mean that whilst policy discussions on REDD are taking place under the AWG-LCA, future policy discussions may also occur in the negotiations on the second commitment period of the Kyoto Protocol.

**REDD as a separate mechanism**

Deforestation is often the largest share of overall emissions for many developing countries and consideration of both the carbon objectives and the biodiversity objectives could warrant a separate mechanism for REDD. Establishing a separate mechanism for REDD could ensure that these objectives are met. Furthermore, negotiations could focus on the issues that are unique to the forestry sector such as ensuring the rights of indigenous people and local communities are taken into consideration and permanence and leakage (see below) are considered. However, negotiating a separate mechanism will mean that other aspects such as technology transfer, capacity building and finances would need to be clearly linked with the REDD mechanism.

**REDD as a NAMA**

NAMAs could be grouped to achieve broader objectives, such as a sectoral mechanism for REDD. NAMAs could include Sustainable Development Policies and Measures (SD PAMs), low carbon development strategies or programmatic CDM. They could be based on unilateral action, conditional or credit generating actions by developing countries. An approach based on a REDD NAMA could include consideration of a number of activities in the forestry sector such s deforestation, forest degradation or even agriculture. In June at the AWG-LCA session in Bonn (Germany), Brazil, Bolivia and Tuvalu supported addressing REDD in the context of NAMAs and Papua New Guinea said that more discussion was required. The European Union called for REDD+ actions to be part of

developing countries low-carbon development strategies[11].

**REDD in the Clean Development Mechanism (CDM)**

There has also been discussion on including REDD as part of a revised and expanded CDM mechanism. Proposals to include avoided deforestation projects were discussed during the negotiations of the Kyoto Protocol's CDM. The benefits of this idea were argued to be the protection of biodiversity and the low cost of carbon credits supplied from avoided deforestation projects. The main disadvantages of the idea related to:

(i) a decreased efficacy in achieving biodiversity objectives when activities could and (did) simply move outside the project boundaries;
(ii) avoided deforestation projects are intrinsically subject to leakage (deforestation activities move elsewhere) and baseline uncertainties (what deforestation would have occurred in the absence of the project); and
(iii) the risk of undermining efforts to reduce fossil fuel emissions by competing with clean energy technologies due to the scale of low-cost credits from avoided deforestation activities.

## 2.3 Scale effect of emission reductions

Meeting a climate target, such as 1.5°C or 2°C goal, means that substantial emission reductions have to be made from both the energy and industrial sources of greenhouse gases as well as from deforestation emissions. Less action on deforestation requires more action on energy related emissions and vice versa. In establishing targets for the post-2012 process, countries will need to consider the scale effect of various mechanisms to achieve emission reduction targets. This is an important consideration not just for a REDD mechanism but for any mechanism established under the Copenhagen agreement and will be a key determinant of the environmental integrity of the mechanism.

However, if emission reduction targets are not set appropriately and the uncertainties peculiar to the accounting of land use change emissions are not addressed properly and fully, the end result is likely to be less action on fossil fuel and industrial emissions than is necessary to meet the climate goals. For example, if deforestation credits were awarded with respect to a business as usual baseline, and allowed to be added to the emission allowances of industrialised countries, much higher fossil fuel emissions than would have otherwise occurred will result. The Annex I countries greenhouse emissions commitments pledged for 2020 collectively add up to an overall cut of between 11% and 18% below 1990 levels by 2020, which is far below the 25-40% range identified by the IPCC to ensure that global temperature does not increase above 2°C. Therefore any decisions on the overall targets must ensure that decisions on a REDD mechanism are taken into consideration.

## 2.4 Indigenous People and Local Communities

Protecting the needs of indigenous people and local communities who depend on forests will be a necessary requirement for any REDD mechanism. The Stern Review[12] states that "clarifying both property rights to forest land and the legal rights and responsibilities of landowners is a vital pre-requisite for effective policy and enforcement". Many Parties have proposed that free, prior informed consent is necessary for the inclusion of indigenous peoples in a REDD mechanism. The concern is that an international

mechanism which focuses on greenhouse gas reductions may safeguard the rights of indigenous people and local communities as this is not its mandate. Discussions on this took place in COP14 in Poznan, 2008, when Parties negotiated over whether to include an 's' at the end of indigenous people.

### 2.5 Drivers of deforestation

The causes of deforestation (both direct and indirect) are complex and vary from country to country as well as within countries over time. Direct causes are physical in nature and refer to the actual process of deforesting such as agricultural expansion, wood extraction and infrastructure development. Indirect causes on the other hand refer to circumstances that promote the direct causes of deforestation such as demographic, economic, technological, policy or institutional and cultural forces[13]. For example, in West and Central Africa, logging, fuel wood collection for domestic use and subsistence agriculture are the most frequent proximate causes. Weak institutions (lack of enforcement and mismanagement), migration and population are the dominant underlying causes in this region. Insecure ownership related to uncertainties of land tenure, which drives the shift from communal to private property is another pattern seen mostly in Africa. Immigration and, to a much lesser degree, natural population growth drive the expansion of cropped land and pasture in 47% of the cases in Africa, together with other underlying drivers[14].

The extension of permanently cropped land for subsistence farming to meet the needs of a growing population is reported particularly for African cases. Other actions that have led to increased deforestation occur where legal protection is conditional on 'productive use' requirements (such as the '*mise en valeur*' required by much land legislation in Francophone Africa, including Cameroon[15]). Furthermore, more attention being paid at the drivers of deforestation and the associated demand for timber from developed countries as well as developing countries. Recognition of demand-side drivers is essential in developing solutions in the international climate regime. For example, a proposal raised by Tuvalu is for Annex I countries to account for emissions from Harvested Wood Products imported from non-Annex I countries[16]. This proposal aims to include Annex I countries in efforts to reduce illegal logging at the international level and take responsibility for their role in deforestation in developing countries. Taking into consideration the drivers of deforestation will be necessary when establishing a mechanism for REDD as it is essential in understanding why deforestation is occurring to enable the best solutions and incentives to stop it.

## 3 Major Scientific, Technical and Methodological Issues

There are a number of scientific, technical and methodological issues associated with reducing emissions from tropical deforestation, these are outlined below.

### 3.1 Definitions

Many new terms will need to be defined in a REDD mechanism. Within the UNFCCC and its Kyoto Protocol there are already definitions for forests and deforestation. Furthermore, a number of developing countries have already selected their forest definition[17] through the Clean Development Mechanism's Afforestation and Reforestation project activities. Deforestation in the Kyoto Protocol is defined as the "the direct, human-induced conversion of forested land to non-forested land". Effectively this

means a reduction in crown cover from above the threshold for forest definition to below this threshold. However, there are as yet no definitions for forest degradation, sustainable management of forests and enhancement of carbon stocks. In 2003, the IPCC was tasked with developing a definition for degradation but could not reach consensus on a single one[18]. Forest degradation relates to a reduction in the quality of a forest area, including the amount of carbon it can store, and not its size. The lack of clear definitions also makes it difficult to establish monitoring systems. Further work is needed to develop definitions for new terms within the REDD mechanism.

### 3.2 Reference Emission Levels (baselines)

Establishing credible reference emission levels for REDD is likely to be difficult because of poor monitoring and data in many countries (see emissions uncertainties below). Furthermore, not all countries have the same rates of deforestation, for example, some countries in Africa have large forests still left intact, whereas others such as Indonesia and Malaysia have historically high levels of deforestation. There is a risk of distorting the level of effort if the reference emission levels are not set correctly. Two approaches to establishing a reference emission levels - one based on historical rates and another based on projections - have been discussed. There are a number of issues associated with both these approaches such as:

(i) agreeing on what an acceptable rate of deforestation would be for any one country including the period of time to calculate the historical emissions and how historical baselines could involve countries with low rates of deforestation.

(ii) estimating a country's level of deforestation at some point in the future based on business-as-usual projections can never be verified. It would also be difficult to prove if projects are additional (what would have occurred in the absence of the project). For an effective REDD mechanism, reference emission levels must be additional and not above business-as-usual.

Due to concerns with the projected baseline option, Parties have been discussing ways to use historic reference emission levels for countries with low rates of deforestation. Options include adjusting the reference emission level through a Development Adjustment Factor, such as taking into consideration national circumstances. The European Union , have proposed that understanding the causes of deforestation , in terms of socioeconomic factors such as commodity prices, tenure rights, forest policies, law enforcement may help in setting reference emission levels .

For the REDD+ activities, conservation and sustainable management of forests, there are further difficulties in establishing reference emission levels because these activities do not lend themselves to an emissions approach as they enhance a countries forest sink. The difficulties arise if a reference case is assumed to be the removal of these forests, which could create perverse incentives to inflate the deforestation baseline. An option for addressing this is that these activities are used as part of a countries national strategy to reduce emissions from deforestation and forest degradation rather than establishing a separate reference level. This is now being proposed by a number of countries such as Nicaragua, Guatemala, Dominican Republic, Honduras, Panama and Tuvalu.

Discussions on whether a global reference emission level could be established are also taking place to address concerns with international leakage (see below). The key

issues here are how to set the global baseline and how countries would be rewarded for reducing emissions against a global baseline.

### 3.3 Displacement of emissions (leakage)

The risk for leakage in REDD is largely due to unbalanced forest policies across countries and linkages to the forest product industry and market. If protecting forests in one country merely leads to increased logging in another (emissions displacement) then the problem of deforestation is not solved. Large scale participation by countries with tropical forests is therefore essential. Modelling studies on forest conservation suggest that under current trade conditions, estimated emissions displacement ranges from 45% - 90% with an average of 70% for most regions/countries[19].

An effective REDD mechanism needs to ensure that there is global participation of all developing countries with tropical forests, otherwise emissions displacement will occur. A critical examination of the financing options is needed to ensure that global participation occurs For example, the CDM has shown that for about 90% of projects, sub-Saharan Africa has only 1.4% of the projects and of the 46 Least Developed Countries that have ratified the Protocol, only 11 have at least one project in the pipeline[20].

Solutions to emissions displacement within countries include a national-accounting framework, however this will not address international leakage. For addressing international leakage other options include: a global approach with coverage of all developing countries with tropical forests; a global baseline to measure where leakage is occurring; voluntary partnership through the Forest Law Enforcement, Governance and Trade (FLEGT) processes being established by the EU; forest certification; and demand side management. More work is needed to examine options to reduce international leakage. These approaches are not likely to eliminate international leakage entirely but could help to control it.

### 3.4 Permanence

For a REDD mechanism to be effective, emission reductions must be permanent. The risk of non-permanence, that emissions will be released back into the atmosphere, is a unique characteristic of the land use sector. A key question is how to ensure that a forest saved today will not be cut down tomorrow? Non-permanence can be caused by human actions through logging or from the impacts of climate change through increased fires or severe storms that can destroy a forest. How the carbon storage potential of tropical forests will change under future climate conditions is highly uncertain, but will need to be considered in developing a REDD mechanism.

The temporary and reversible nature of forests as carbon sinks means that options which allow countries to offset their emissions with REDD credits will create the risk of higher overall emissions, if the forest is destroyed, than would otherwise have occurred. This in turn would risk the chance of meeting the climate goal of stabilising greenhouse gases. Policies will need to be designed to ensure long-term permanence of forests. Options could include:

(i) an insurance system, where an insurance company replaces lost credits;

(ii) a discount factor, where reductions are higher than the compliance units used to fund them;
(iii) temporary crediting, similar to afforestation and reforestation projects under the CDM which depends on the lifetime of a project; or
(iv) corridor buffers, where a portion of credits is held in a reserve.

### 3.5 Scale of implementation: national vs. sub-national

The issue surrounding the scale of implementation can be summed up with this question: should the action to reduce emissions including establishing reference emission levels, estimating emission reductions and reporting them be undertaken at the national or sub-national level? The proposal brought forward by Papua New Guinea and Costa Rica in 2005 was based on a national-level accounting system, this has been supported by a number of Parties in particular the European Union. Other proposed approaches allow including sub-national activities or starting with sub-national activities and then scaling up to a national approach when countries choose to do so.

The key issues of concern with sub-national approaches are the displacement of emissions (or leakage) and lack of additionality (what would have occurred in the absence of the project). Allowing countries to undertake sub-national projects, could impact the level of effort to reduce greenhouse emissions as leakage is estimated to be around 45-90% for projects. Even at the national level there may be international leakage if deforestation simply shifts to another country. Capacity building will be essential to enable countries to develop national accounting frameworks to monitor deforestation emissions as well as to build the institutional and governance structures needed to implement REDD actions.

### 3.6 Measuring, Reporting and Verification

Rigorous and reliable measuring, reporting and verification (MRV) procedures are needed for any REDD mechanism. At present adequate monitoring and verification of tropical deforestation is not being done in many developing countries. A high degree of uncertainty exists in relation to the actual deforestation rate and the consequent emissions. Detailed forest biomass studies have not been conducted in all tropical forest countries. This makes estimating different carbon pools (above-ground biomass, below-ground biomass, dead wood, litter, and soil organic matter) problematic. Technological and forest monitoring capacity, and capacity to govern forested areas also vary amongst tropical countries with large forest tracts and/or high emissions from deforestation. Whatever system is adopted, consistent monitoring systems that meet a set of international standards agreed to by Parties will need to be established in developing countries to ensure the integrity of emission reductions from deforestation[21]. Measuring and verification requirements will also need to increase in stringency if options to move to a carbon market are considered.

Whilst deforestation can be detected by remote sensing, it is much more difficult to detect degradation because it is more difficult to see the removal of a few trees, loss of undergrowth, or branches and small trees. Understanding the causes of forest degradation such as selective logging; forest fires; over exploitation for fuel wood and grazing; and invasion of exotic species into already degraded areas can go some way into monitoring

forest degradation[22]. However, ground-truthing which is much more expensive will be required.

### 3.7 Capacity building

Lack of capacity, particularly in forest monitoring and institutional development is a key issue for many developing countries. A recent report prepared for the UNFCCC found that many countries have significant capacity in remote sensing but capacity in forest carbon inventories is generally low and very few countries have the capacity to estimate forest carbon stocks beyond the IPCC's default value Tier 1[23] level[24]. Another study on governance found that the countries with the weakest capacity and capability for remote sensing and forest inventories are predominantly in Africa and that there was a correlation between countries with weak capacity and significant log exports.[25] Furthermore, there is also little information available on the cost of forest carbon monitoring systems at national level[26], however by establishing regional cooperation it would reduce the costs of remote sensing capacity[27].

Implementing institutional framework and governance structures will require financing, technology and capacity building support. However, the key to success in establishing these will be to promote synergies with mitigation and adaption programmes that ensure the maximum benefit to the local environment as well as to local communities.

## 4 Conclusions and Recommendations

The major issues for establishing a REDD mechanism for Africa will be to ensure there is equitable benefit sharing of a mechanism which allows for the broadest participation of all countries with tropical forests to access the necessary resources to reduce emissions. Financial and technical support will be needed in many African countries to develop the governance structures, institutional and policy implementation frameworks as well as establishing coordinating bodies and stakeholder participation. Furthermore, technology transfer and capacity building is needed to strengthen monitoring systems in the forest sector and methodologies to measure emission reductions.

The negotiations in September in Bangkok will continue on the revised AWG-LCA negotiating text[28] released in June. The draft text includes all proposal from Parties on REDD. The draft text includes the various options for the scope of a REDD mechanism; the financial options and how it is linked to broader financing options in the LCA text; the need to develop strategy and action plans; if REDD is considered as a separate action or a NAMA; the guidelines for including indigenous peoples and local communities; the MRV requirements and the links to technology transfer, capacity building and adaptation.

Furthermore, because of the inclusion of amendments for a REDD market mechanism under the Kyoto Protocol, Parties will need to be aware of policy discussions on REDD also taking place in this Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP). Therefore, it is essential for both African negotiators and Least Developed Countries within Africa to participate in the REDD debate to firstly understand the implications, secondly to ensure their positions are represented and thirdly, to ensure that African countries are not excluded in accessing financing similarly to the problems associated with the CDM.

REDD: the Role of land use and forestry in mitigation

Supporting proposals to reduce emissions from deforestation and forest degradation is important. Equally important are meeting the goals of avoiding dangerous climate change, ensuring biodiversity protection and taking into consideration indigenous peoples and local communities concerns. These issues will need to be addressed to ensure the environmental integrity of any future climate change agreement.

**A REDD Mechanism will need to be:**

(i) Multi-objective:
   contributing to the goal of rapid global emission reductions, to ensure that global temperature stays well below $2^{o}C$, in line with avoiding dangerous climate change. Such a mechanism must avoid the negative scale effects on the carbon market and not undermine fossil $CO_2$ reductions.
   protecting high biodiversity value forests as well as existing forests in regions where deforestation is low, starting to occur or is not active but imminent in the future
   Ensuring the rights of indigenous people and local communities and their participation.

(ii) Adequately funded from a stable and reliable source that is additional.

(iii) Equitable and ensure benefits are shared both between and within countries. This will incentivize all countries with tropical forests to participate in a REDD mechanism.

(iv) Methodologically robust, ensuring all uncertainties are addressed by:
   minimising leakage (through effective national accounting frameworks);
   developing appropriate reference emissions levels that lead to real emission reductions; and
   building in-country capacity for measuring, reporting and verifying emissions to address emissions uncertainties.

## Annex 1: UNFCCC documents relating to REDD

This table includes: submissions from Parties, draft conclusions and workshop reports.

| Decisions and Reports (with hyperlinks) | Date (latest) | Details |
|---|---|---|
| Web link | | Web portal on REDD issues |
| FCCC/SBSTA/2009/L.9 | June 2009 | Draft conclusions proposed by the Chair, SBSTA 30 Bonn, Germany |
| Workshop web link | March 2009 | Expert Meeting on Methodological Issues relating to Reference Emission Levels and Reference Levels, Bonn, Germany |
| FCCC/SBSTA/2009/MISC.2 and Add.1 | March 2009 | Submissions: Information on experiences and views on needs for technical and institutional capacity-building and cooperation. |
| FCCC/SBSTA/2009/MISC.1 and Add.1 | March 2009 | Submissions: Issues relating to indigenous people and local communities for the development and application of methodologies. |
| FCCC/SBSTA/2008/L.23 | Dec 2008 | Draft conclusions proposed by the Chair, SBSTA 29, Poznan, Poland |
| FCCC/SBSTA/2008/11 | Sept 2008 | Report on the workshop on methodological issues relating to reducing emissions from deforestation and forest degradation in developing countries, Tokyo, Japan |
| FCCC/AWGLCA/2008/CRP.5 | Aug 2008 | Report of the workshop on 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, AWG-LCA Accra, Ghana |
| Workshop web link | 25-27 June 2008 | Workshop on Methodological Issues relating to Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, Tokyo, Japan |
| FCCC/SBSTA/2008/L.12 | June 2008 | Draft conclusions proposed by the Chair, SBSTA 28 |
| FCCC/SBSTA/2008/MISC.4, Add.1, Add.2 and Add.3 | April 2008 | Submissions: Views on outstanding methodological issues related to policy approaches and positive incentives to reduce emissions from deforestation and forest degradation in developing countries. |
| FCCC/CP/2007/6/Add.1 | Dec 2007 | Decision 2/CP.13 - Reducing emissions from deforestation in developing countries: approaches to stimulate action, Bali, Indonesia |
| FCCC/SBSTA/2007/MISC.14 and Add.1, Add.2 and Add.3 | Sept 2007 | Submissions: Views on issues related to further steps under the Convention related to reducing emissions from deforestation in developing countries: approaches to stimulate action. |
| FCCC/SBSTA/2007/L.10 | May 2007 | Draft conclusions, SBSTA 26 |
| FCCC/SBSTA/2007/3 | April 2007 | Report on the second workshop on reducing emissions from deforestation in developing countries, Cairns, Australia |
| FCCC/SBSTA/2007/MISC.2 and Add.1 | March 2007 | Submissions: Views on the range of topics and other relevant information relating to reducing emissions from deforestation in developing countries. |
| FCCC/SBSTA/2007/MISC.3 | March 2007 | Submissions from IGOs: Views on the range of topics and other relevant information relating to reducing emissions from deforestation in developing countries. |
| Web link | March 2007 | Web link for NGOs submission on reducing emissions from deforestation |
| FCCC/SBSTA/2006/L.25 | November 2006 | COP 12 - Draft conclusions proposed by the Chair, COP12, Nairobi, Kenya |
| FCCC/SBSTA/2006/10 | September 2006 | Report on a workshop on reducing emissions from deforestation in developing countries, Rome, Italy |
| Part I | August 2006 | *Background papers:* Part I - Scientific, socio-economic, technical and methodological issues related to deforestation in developing countries |
| Part II | August 2006 | *Background papers:* Part II - Policy approaches and positive incentives |

REDD: the Role of land use and forestry in mitigation

| Decisions and Reports (with hyperlinks) | Date (latest) | Details |
|---|---|---|
| Addendum 1 | August 2006 | *Background papers:* Addendum 1 - Synthesis of relevant information contained in national communications |
| Addendum 2 - (Part I) | August 2006 | *Background papers:* Addendum 2 - (Part I) - Synthesis of submissions by Parties on issues relating to reducing emissions from deforestation in developing countries |
| Addendum 2 - (Part II) | August 2006 | *Background papers:* Addendum 2 - (Part II) - Synthesis of submissions by accredited observers relating to reducing emissions from deforestation in developing countries |
| FCCC/SBSTA/2006/L.8 | May 2006 | Draft conclusions proposed by the Chair, SBSTA 24 |
| FCCC/SBSTA/2006/MISC.5 and Add.1 | March 2006 | Submissions: Issues relating to reducing emissions from deforestation in developing countries and recommendations on any further process. |
| Web link | March 2006 | Web link for IGOs submission on REDD |
| Web link | March 2006 | Weblink for NGOs submission on REDD |
| FCCC/CP/2005/L.2 | December 2005 | COP 11 - Reducing emissions from deforestation in developing countries: approaches to stimulate action. Draft conclusions proposed by the President, Montreal, Canada |
| FCCC/CP/2005/MISC.1 | March 2005 | Reducing emissions from deforestation in developing countries: approaches to stimulate action. Submissions from Papua New Guinea. |

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## Annex 2: Parties proposals on a REDD mechanism

**Table 2: Positions of Parties on REDD, July 2009**

| Countries | Financing | Scope | Scale of implementation | Reference emission levels | MRV | Architecture of mechanism: e.g. NAMA | Indigenous People and local communities and Biodiversity |
|---|---|---|---|---|---|---|---|
| **Africa Group** | Adequate financing including market and public funds | REDD plus | | | | | |
| **Argentina** | Decided by Party | REDD plus and HWP | National and sub-national decided by Party | Taking into account national circumstances | | | |
| **Australia** | Voluntary market post-2012 fully fungible credits | REDD and Afforestation and Reforestation | For both developing and developed countries<br><br>National which can support sub-national | Historical and Projected.<br><br>National forest emissions levels agreed by COP. | Simply MRV with national carbon monitoring as prerequisite for market.<br>Non-permanence addressed with a 'confidence buffer' | Inclusion of REDD mechanism in KP or COP | Maximise co-benefits such as biodiversity and improvement of rights of indigenous and forest dependent peoples |
| **Bolivia** | Funding windows, Public funds – no offsets e.g. G77 financial mechanism | | | National | | REDD separate to NAMA Mechanism under the COP | Reference to the UN Declaration on the Rights of Indigenous Peoples. |
| **Brazil** | Fund proposal under UNFCCC no offsetting | REDD (gross emissions) | | Historical | Methodological work needed on REDD plus activities | REDD as NAMA Mechanism under the COP | |
| **Canada** | Market | | | Historical, taking into account of national circumstances | | | |

REDD: the Role of land use and forestry in mitigation

| Countries | Financing | Scope | Scale of implementation | Reference emission levels | MRV | Architecture of mechanism: e.g. NAMA | Indigenous People and local communities and Biodiversity |
|---|---|---|---|---|---|---|---|
| **Coalition for Rainforest Nations** | New and additional ODA, market-linked sources and carbon market | REDD+. Forest degradation is voluntarily reported | National (opposed to sub-national) | Historical, with a correction factor; Projected emission or removal enhancements | Relevant IPCC guidelines; unmanaged or unmanageable lands not included; address domestic leakage only | No position on REDD as NAMA Mechanism under COP | Recognise rights of rural communities and indigenous peoples |
| **China** | No offset mechanism | REDD plus –not LULUCF | | Projected | | | |
| **Colombia** | REDD certified emission reductions fully fungible and REDD Plus fund | REDD plus | National or sub-national decided by Party | | Entity of group to verify and certify emission reductions | REDD separate to NAMA Mechanism under the COP | |
| **Congo Basin countries** | Market and non-market including stabilisation fund for forest conservation | REDD – forest degradation is important | Both national and sub-national | Historical ,with a development adjustment factor (Gabon: projected) | Technical shortcomings in MRV | | Indigenous peoples rights important |
| **Costa Rica** | Markets – polluter pays or payment for environmental services | REDD plus | National with sub-national activities decided by the Party | Historical | GPG for LULUCF | | Actively engage indigenous peoples and local communities |
| **Ecuador** | Phased approach: market or non-market mechanism - no offsets | Forestry sector | National which includes sub-national (designed to scale up to national implementation) | | IPCC guidelines and GPG for LULUCF each Party develops a unique GHG emissions accounting and monitoring system | | Inclusion of indigenous people and local communities |

| Countries | Financing | Scope | Scale of implementation | Reference emission levels | MRV | Architecture of mechanism: e.g. NAMA | Indigenous People and local communities and Biodiversity |
|---|---|---|---|---|---|---|---|
| **European Union** | Proposed Global Forest Carbon Mechanism in the short term (auctioning) and also future consideration of carbon market | REDD which promotes role of conservation, SFM and enhancement of carbon stocks | National | Historic , taking into account national circumstances | Performance based | Low carbon strategies | Co-benefits incl. biodiversity protection and engaging local communities and indigenous peoples |
| **Guyana** | Market with combination of non-market | REDD plus | National (opposed to sub-national) | Historical and projected | IPCC methodology | REDD should be a stand-alone mechanism and not a NAMA | |
| **India** | Market for REDD; non-market for REDD plus | REDD plus | National | Projected | | | |
| **Indonesia** | Market and non-market funds | REDD plus | Decision by Party on national or sub-national | Historical or projected | IPCC and FAO | | |
| **Japan** | Funds and/or markets | REDD and AR | | Historical, taking into account socioeconomic trends | | | |
| **Mexico** | Variety of sources:<br>Fund for REDD plus activities<br>Market for REDD e.g. Green Fund proposal | REDD plus | National accounting system with flexibility for project level, sub-national or national | Historical, taking into account national circumstances. | | | Recognise rights indigenous people and local communities |
| **New Zealand** | New market mechanism | REDD or REDD plus – process needed to define scope | Complement national policies | | Options to address non-permanence to be determined | REDD as a NAMA under COP | |

| Countries | Financing | Scope | Scale of implementation | Reference emission levels | MRV | Architecture of mechanism: e.g. NAMA | Indigenous People and local communities and Biodiversity |
|---|---|---|---|---|---|---|---|
| **Nicaragua on behalf of Guatemala, Dominican Republic, Honduras and Panama (supported by El Salvador)** | Different mechanisms – such as trust funds or a forest reserve fund. Additional to QELROs | REDD<br>REDD plus activities could be addressed under implementation of REDD measures | National with option of sub-national on a transitional basis | | Address leakage and non-permanence | REDD as NAMA in synergy with national adaptation measures | Promote participation of indigenous people and local communities |
| **Norway** | Phased approach with funding mechanism based on auctioning | Emissions and removals from whole forestry sector | National | Historical reference level taking into account national circumstances and a global reference level | MRV for REDD consistent with MRV for NAMAs | REDD as a NAMA | Safeguards for biodiversity, respect rights of indigenous people. |
| **Panama and Paraguay** | REDD through market or non-market and REDD plus activities through fund; and finances from auctioning | REDD plus | Nested approach – sub-national to national | | Recent IPCC guidelines for greenhouse gas inventories - annual reporting | REDD separate to NAMA | Reference to the UN Declaration on the Rights of Indigenous Peoples. |
| **Suriname** | Adequate financing needed | REDD plus | | Projected | Broad participation to avoid international leakage and equity | | |
| **Switzerland** | Market and other mechanisms such as green funds | REDD plus | National | | | REDD plus as a NAMA including agriculture | Effective participation of indigenous peoples and local communities |

| Countries | Financing | Scope | Scale of implementation | Reference emission levels | MRV | Architecture of mechanism: e.g. NAMA | Indigenous People and local communities and Biodiversity |
|---|---|---|---|---|---|---|---|
| **Tuvalu** | Auctioning of allowances; levies on international transport; and trust funds.<br>REDD funding window in a broader climate change fund;<br>REDD Window of international climate fund. | REDD only (REDD plus activities are activities to reduce emissions from deforestation and forest degradation) | National | Historical | | REDD as a NAMA | Reference to the UN Declaration on the Rights of Indigenous Peoples and ensure rights of indigenous peoples and local communities are not adversely affected. |
| **USA** | Financial provisions part of overall package includes market and non-market | Broader view than REDD plus (land based approach) | In relation to pilot projects – national and sub-national | Historical, adjusted over time and guided by long-term goal | MRV for market only – not non-market<br>IPCC GPG and 2006 | REDD integrated into NAMAs and in the context of low-carbon strategies.<br>Mechanism under COP | |

Sources: Submissions from Parties Ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan FCCC/AWGLCA/2009/MISC.4 (Part I), (Part 2), Add.1, Add.2, Add.3, FCCC/SBSTA/2008/MISC.4, Add.1, Add.2 and Add.3

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## END NOTES

[1] UNFCCC 4.1(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

[2] FCCC/CP/2007/6/Add.1- 1/CP.13 Bali Action Plan 1. (b) (iii)

[3] Pep Canadell, C Lequre, M Raupach, P Ciais, T Conway, C Field, S Houghton and G Marland (2009) Global carbon sources and sinks: 2007 Update, http://www.globalcarbonproject.org/carbonbudget/index.htm

[4] The opportunity cost is the foregone profits from timber and agricultural commodity sales and often does not include the costs of forest protection or maintenance.

[5] The Net Present Value (NPV) of income (calculated over 30 years, using a discount of 10%, except for Indonesia which uses 20%) ranges from $2 per hectare for pastoral use to over $1000 for soya and oil palm, with one off returns of $236 to $1035 from selling timber. Stern N (2006) "Chapter 25: Reversing Emissions from Land Use", in *Stern Review: The Economics of Climate Change*, UK.

[6] Eliasch, J (2008) Eliasch Review: Climate Change, Financing Global Forests, UK.

[7] Claire Stockwell, B Hare and K Macey, "Designing a REDD Mechanism: The TDERM Triptych" in Richardson et al. eds. Climate law in developing countries post-2012: North and South Perspectives (USA: Edward Elgar Publishing) 2009 forthcoming.

[8] World Bank Forest Carbon Partnership Facility, Participants http://www.forestcarbonpartnership.org/fcp/node/203

[9] UN-REDD programme, http://www.un-redd.org/Home/tabid/565/language/en-US/Default.aspx

[10] Bali Action Plan 1(b) ii: "Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner."

[11] ENB (2009) LCA highlights Monday 8 June http://www.iisd.ca/vol12/enb12417e.html

[12] Stern N (2006) "Chapter 25: Reversing Emissions from Land Use", in *Stern Review: The Economics of Climate Change*, UK.

[13] Geist, H. and E. Lambin (2001), What Drives Tropical Deforestation? A Meta-Analysis of Proximate and Underlying Causes of Deforestation based on Subnational Case Study Evidence, Louvain-la-Neuve, Belgium: LUCC International Project Office.

[14] ibid

[15] Cotula, L. and Mayers, J. 2009. Tenure in REDD – Start-point or afterthought? Natural Resource Issues No. 15. International Institute for Environment and Development. London, UK.

[16] Tuvalu (2009) Submission Tuvalu submission on definitions, modalities, rules and guidelines for the treatment of land use, land-use change and forestry (LULUCF) in the second commitment period (AWG-KP), FCCC/KP/AWG/2009/MISC.5/Add.1

[17] For definition of forest and deforestation see Annex of Decision 16/CMP.1: Land Use, Land Use Change and Forestry for further definitions: http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=3 ; for elected forest parameters of developing countries see: http://cdm.unfccc.int/DNA/allCountriesARInfos.html

[18] Penman, J. *et al*. (eds), *Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types*, Kanagawa, Japan: Intergovernmental Panel on Climate Change.

[19] Jiangban Gan and Bruce A. McCarl, 'Measuring transnational leakage of forest conservation', 2007, Ecological Economics, 64, 423-432.

[20] Fenhann J. (2008) 'UNEP Risø Centre's CDM/JI Pipeline Analysis and Database' http://cdmpipeline.org

[21] In Poznan, the SBSTA conclusions on REDD set out the following guidelines to be taken into account for MRV: The use of the Revised 1996 IPCC Guidelines For National Greenhouse Inventories and encouraging the use of the Good Practice Guidance For Land Use, Land-Use Change and Forestry, as appropriate, as a basis for estimating anthropogenic forest-related emissions by sources and removals by sinks; The need to establish robust and transparent national forest monitoring systems, following consideration of their requirements; If appropriate, the need to establish robust and transparent sub-national forest monitoring systems, following consideration of their requirements; The encouragement of national forest monitoring systems that allow transparent and independent review of their results. Source: COP14 (2008) Decision L23: Reducing emissions from deforestation in developing countries: approaches to stimulate http://unfccc.int/resource/docs/2008/sbsta/eng/l23.pdf

[22] GOFC-GOLD (2008) Reducing greenhouse gas emissions from deforestation and degradation in developing countries: a sourcebook of methods and procedures for monitoring, measuring and reporting, GOFC-GOLD Report version COP13-2, (GOFC-GOLD Project Office, Natural Resources Canada, Alberta, Canada)

[23] The IPCC methodology is based on different tiers or levels of reporting. The lowest, Tier 1, provides default values of the carbon content of different categories of forests. Higher tiers (2 and 3) employ nationally-based definitions and country specific criteria where these can be shown to be more reliable. The IPCC methodologies also incorporate a

'conservative' approach where countries only account for what can be reliably estimated to avoid overestimating or underestimating.

[24] UNFCCC (2009) Technical Paper: Cost of implementing methodologies and monitoring systems relating to estimates of emissions from deforestation and forest degradation, the assessment of carbon stocks and greenhouse gas emissions from changes in forest cover, and the enhancement of forest carbon stocks, Germany.

[25] Hardcastle P.D., and Baird D. 2008. *Capability and cost assessment of the major forest nations to measure and monitor their forest carbon for Office of Climate Change.* Penicuick: LTS International.

[26] See endnote xxi

[27] See endnote xxii

[28] UNFCCC (2009) Revised negotiating text: Note by the secretariat 22 June 2009, http://unfccc.int/resource/docs/2009/awglca6/eng/inf01.pdf