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REDD Crediting vs. REDD Funds – How Avoided Deforestation under the UNFCCC Should Be Financed

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Abstract

Since 2005, the parties to the United Nations Framework Convention on Climate Change (UNFCCC) negotiate how the protection of rainforests could be integrated into the climate regime (Reducing Emissions from Deforestation and Forest Degradation, REDD). This discussion paper primarily addresses the question of how financing of avoided deforestation should be organized. For this purpose, the authors first trace the negotiation process until the end of 2009. A short excursus then describes and analyses the integration of afforestation and reforestation activities into the Clean Development Mechanism. In the main part, the authors present the basic determinants for a possible REDD mechanism followed by a deeper look into financing options. Two main approaches can be identified: on the one hand, the introduction of a public fund, which acquires and manages financial means and distributes them to developing countries. On the other hand, financial resources could be raised via the international carbon market. The authors conclude that a combination of both financing approaches would not only raise the highest amount of financial means but also serve best to reduce several risk factors. In doing so, a temporal differentiation should be made by first raising financial means through a fund in order to gradually switch to a market integration. This process should be carried out with close connection to the other building blocks of the UNFCCC negotiations, especially concerning the setting of mid- and long-term emission reduction goals. Certainty on these goals is essential to estimate possible implications of a market integration.

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List of Acronyms

A/R	Afforestation and Reforestation
AAUs	Assigned Amount Units
AFOLU	Agriculture, Forestry and other Land Use
AIJ	Activities Implemented Jointly
AOSIS	Alliance of Small Island States
BAU	Business as Usual
CATIE	Tropical Agricultural Research and Higher Eductation Center
CBD	Convention on Biological Diversity
CCAP	Center for Clean Air Policy
CDM	Clean Development Mechanism
CDM EB	Clean Development Mechanism Executive Board
CEOS	Committee on Earth Observation Satellites
CERs	Certified Emission Reductions
CfRN	Coalition of Rainforest Nations
COMIFAC	Commission des Forêts d'Afrique Centrale
COP	Conference of the Parties
DAF	Development Adjustment Factor
DNA	Designated Nation Authority
EDF	Environmental Defence Fund
ERPAs	Emission Reduction Purchase Agreements
EU	European Union
EU-ETS	EU Emissions Trading Scheme
FAO	Food and Agriculture Organization of the United Nation
FCPF	Forest Carbon Partnership Facility of the World Bank
GHG	Greenhouse Gas
GL-AFOLU	Guidelines for National Greenhouse Gas Inventories for Agriculture, Forestry and Other Land Use
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics
GPG-LULUCF	Good Practice Guidelines for Land-Use, Land-Use Change and Forestry
HFLD	High Forest Low Deforestation
HSI	Human Society International
IPCC	Intergovernmental Panel on Climate Change
lCERs	Long-Term Certified Emission Reductions
LULUCF	Land-Use, Land-Use Change and Forestry
MRV	Measuring, Reporting, and Verification
NGOs	Non-Governmental Organizations
OCC	UK Office for Climate Change
PDD	Project Design Document
PNG	Papua New Guinea
RED	Reducing Emissions from Deforestation in Developing Countries
REDD	Reducing Emissions from Deforestation and Forest Degradation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SFM	Sustainable Forest Management
tCERs	Temporary Certified Emission Reductions
TCG	Terrestrial Carbon Group
TDERUs	Tropical Deforestation Emission Reduction Units
UNDP	United Nations Development Programme
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

Forests cover 31% of the world's total land area. More than half of the total forest area is concentrated in the five most forest-rich countries Russia, Brazil, Canada, the USA and China. Tropical forests represent more than 20% of forested areas on Earth. Three main areas of tropical moist forests can be identified, all of them lie between 10 degrees north and south of the equator and extend across countries in Latin America, Africa and the Indo-Malaysian area (FAO 2010).

Worldwide, forests perform a variety of economic and social functions: they store significant amounts of CO_2 while at the same time offering further environmental benefits related to, among other things, biodiversity. Tropical forests perform important eco-system services such as water purification and erosion prevention. Furthermore, 60 million indigenous people depend directly on forests and the livelihoods of more than 1.5 billion people are to some extent dependent on forest resources. Last not least tropical forests hold up to 90% of the world's natural species (European Commission 2008; Parker et al. 2009a).

According to the IPCC, deforestation and forest degradation activities produce around 20% of the global greenhouse gas (GHG) emissions. This makes forestry the third largest source of GHG emissions – larger than the total of global transport emissions. Experts estimate that an area of forest equaling the size of England is cleared every year in the tropics (Eliasch 2008). While the overall rate of deforestation shows some signs of decreasing in several countries, it continues at high rates in most forest nations. In the last decade alone, around 13 million hectares of forest were destroyed every year, cp. Figure 1 (FAO 2010).

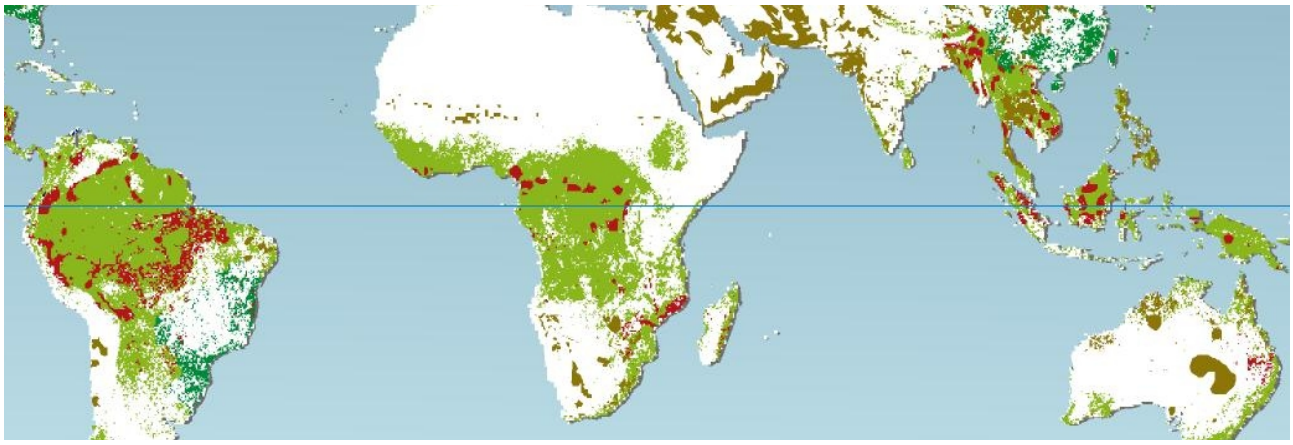

Figure 1: Main active deforestation fronts; Source: Millenium Ecosystem Assessment (2005)

Drivers of deforestation are diverse and complex and vary from country to country. The core drivers of deforestation in Africa are intensified use of forests by local communities to provide sources of food, farmland or fuel. Poverty and population pressure further intensify this small-scale subsistence farming in this region.

The main threat to the forests in South America, however, is large-scale deforestation, mostly undertaken by private enterprises for the production of beef and soy for export markets. In South East Asia, the direct causes of deforestation are a combination of the drivers found in Africa and Latin America, with production of palm oil, coffee and timber exerting high pressure on natural forests. The main underlying causes of deforestation and unsustainable forest management are attributed to ineffective governance, linked to weakly implemented land-use policies and uncertain land-tenure regimes (European Commission 2008; Parker et al. 2009a).

This policy paper looks at the negotiations on deforestation and forest degradation within the global climate regime. The Parties to the United Nations Framework Convention on Climate Change (UNFCCC) have been discussing this agenda item since 2005. While some aspects such as methodological issues and pilot activities have made progress since, an overall policy framework for Reducing Emissions from Deforestation and Forest Degradation (REDD) is still missing. The focus of this paper lies mainly on financing issues and the question whether funding for deforestation should be generated via the global carbon markets or through public funding.

In order to gain a first overview, we begin with a short summary of the REDD negotiations from 2005-2009, followed by a look at how and why Afforestation and Reforestation (A/R) was included in the CDM. The current status of A/R CDM is reviewed and lessons learnt for other forestry issues are analysed. The main part of the paper describes first main determinants of a possible deforestation regime. Second, the different proposals for REDD funding are presented and evaluated. The possible role of the carbon markets is looked at in detail, including a review of the possible consequences for the global carbon markets in general. Finally, conclusions are drawn and tentative recommendations are derived, taking also into account currently existing research gaps.

1 Development of Negotiations on Forest Protection in Developing Countries within the Climate Regime

After the Rio Conference failed to negotiate a forest convention in 1992, expectations to cover this topic in the emerging climate regime were high. However, the UN Framework Convention on Climate Change does not include a specific mandate on the matter but merely mentions the possibility to use the „enhancement of sinks“ to mitigate emissions. Avoiding deforestation thereafter played a role in the pilot phase for the flexible mechanisms, the activities implemented jointly (AIJ). Although Article 12 of the Kyoto Protocol does not cover forestry, afforestation and reforestation were included in the CDM in 2000. Yet it was not until 2005, when a proposal by Papua New Guinea (“PNG-Proposal”) brought the issue of avoiding emissions from deforestation back to the table of the international climate policy arena.

This chapter traces the negotiations on emission reductions from deforestation in developing countries since the introduction of the PNG-Proposal in 2005. This is followed by an excursion into the project-based world of the Clean Development Mechanism (CDM). Within the CDM, afforestation and reforestation project activities (A/R) are eligible. Therefore, we briefly look at the history of forest activities in the CDM, followed by an analysis of current state of affairs of A/R CDM and the reasons for its low deployment, which provide important insights for a future REDD regime.

1.1 A Brief History of the Agenda Item ‘Reducing Emissions from Deforestation in Developing Countries’

1.1.1 Compensating Emission Reductions in Deforestation

At a UNFCCC Policy Maker Seminar in 2005, the issue of avoiding deforestation in Developing Countries was officially introduced into the international climate negotiations for the first time by Papua New Guinea and Costa Rica. Broad support for the issue at the Montreal Climate Summit by many Parties resulted in an agreement to consider the proposal on “Reducing Emissions from Deforestation in Developing Countries” (RED) during a two-year process facilitating an exchange of information and discussions. The Papua New Guinea proposal suggested a fair and equitable access to carbon markets as a condition for substantial engagement. Parties proposed to either establish an optional protocol under the Climate Convention or to include avoided deforestation activities on a project-by-project basis in the CDM. Problems that arose in the discussions dealt with the question of property rights of forests, the permanence of carbon sinks as well as concerns about how to implement a good and correct monitoring system (UNFCCC 2005; Wittneben et al. 2006).

A definition of deforestation had already been adopted under the Marrakesh Accords in 2001:

Box 1: Definition of Deforestation

> "Deforestation" is the direct human-induced conversion of forested land to non-forested land.

Source: UNFCCC 2001

The Papua New Guinea proposal was further discussed at the UN climate change summit in Nairobi in 2006. Concerns were raised on how to set baselines or targets as well as which areas to include, how to implement monitoring systems and verify benefits without creating loopholes in the climate regime. A new proposal of the Brazilian government submitted in a workshop earlier in 2006 suggested establishing a new fund fuelled by donations from industrialized countries, which would support developing countries in their RED activities. The participation was to be voluntary. Incentives were proposed to include new and additional financial resources, transfer of technology, capacity building and enhancement of endogenous capacities. Brazil opposed the idea of using RED for the commitments of Annex-I countries and thus argued that RED should only occur under the UNFCCC and not in an Annex under the Kyoto Protocol (tropicalforestgroup.org 2007). The EU as well as G77/China supported the Brazilian proposal in contrast to the US who pointed to the inadequate assessment of many technical questions. Finding no consensus, the Parties agreed on discussing financial incentives to avoid deforestation as well as technical and methodological requirements for the implementation in a second workshop in early 2007 (Sterk et al. 2007; tropicalforestgroup.org 2007; UNFCCC 2006).

1.1.2 Expanding the Scope

Reduced deforestation, i.e. a non-temporary change of land use from forest to other land use or the depletion of forest crown cover to less than 10%, can lead to an increase in the degradation of forests. Forest degradations are changes within the forest class which negatively affect the stand or site and, in particular, lower biological productivity, capacity and diversity. As awareness about the connection between reduced deforestation and forest degradation had grown, the UN climate change summit in Bali in 2007 saw the extension of the topic introducing the concept "Reducing Emissions from Deforestation and Degradation in Developing Countries" (REDD).

Furthermore, India emphasized at the Bali meeting the importance of the inclusion of "forest conservation, sustainable management of forests as well as enhancement of forest carbon stocks" into REDD. The intention was to reward countries which have already been preventing deforestation for a long time (such as India) and thus have less capacity to reduce deforestation in the future. In the end, the text was not changed in favour of India, but it mentions conservation under "further consideration". Parties also debated on how to integrate deforestation into long-term cooperative action under the Climate Convention.

The final decision taken at the Bali climate summit encouraged stakeholders to design demonstration activities, supported by indicative guidance on, inter alia, MRV issues and suitable reference levels. A two-years

process under the SBSTA was to examine REDD considering methodological issues in order to provide more information about policy approaches and positive incentives. Moreover, the Parties agreed that a future mechanism should include preservation and enhancement of forest carbon stocks and consist of national as well as subnational forestry activities. A policy decision on how to finance REDD activities, however, was not taken (Watanabe et al. 2008).

At the Poznan climate summit in 2008 progress was made regarding general concerns about methodological problems, with the SBSTA discussing the establishment of reference emission levels, the scale of implementation, different options for financing REDD as well as options for the assessment of the effectiveness of REDD actions (Santarius et al. 2009; UNFCCC 2008). Several Parties turned in proposals on measurable, reportable and verifiable mechanisms associated with the risks of leakage, non-permanence, baselines and additionality of emission reductions.

One of the most important debates at the Poznan summit dealt with the inclusion of the rights of indigenous peoples and local communities in policy approaches to secure land rights, livelihoods and culture and support them politically and financially. While Parties could not agree to a reference to the UN Declaration on the Rights of Indigenous Peoples, the final text mentions indigenous "people" and their rights (Santarius et al. 2009). Likewise, REDD's possible co-benefits for biodiversity were not included in the final decision. On the other hand, an agreement was achieved on the inclusion of conservation, sustainable management of forests and the enhancement of carbons stocks into REDD, expanding it to "REDD+".

In contrast to the overall negotiations at the UN climate summit in Copenhagen, negotiations on REDD made considerable progress. At Copenhagen, REDD discussions focused on the goals for REDD+, the funding of early REDD+ activities, methodological issues and emission reference levels. Baselines could either be implemented at sub-national scale as favored by the USA and Colombia, meaning measuring carbon fluxes of local areas or limited by project ownerships, or using national baselines for broader policy approaches in order to address the drivers of deforestation (details on determinants and design options for REDD architectures are discussed in chapter 2 of this paper). While the COP did not take a decision neither on baselines nor on funding or on concrete targets, a comprehensive text document addressing major issues was developed, which now awaits negotiations eliminating the remaining brackets on crucial issues (Sterk et al. 2010).

1.2 The Inclusion of Forests in the CDM

Before the introduction of REDD, forests had already been playing an important role in international climate negotiations due to their possible usage as carbon sinks:

Box 2: Definition of Carbon Sinks

> "Sink" means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

Source: UN 1992

This means carbon sinks are either

- withdrawing CO_2 from the atmosphere due to net-plant growth or
- fixing carbon into biomass and soil (Tyczewski 2006).

Recognizing the capacity of forests to be part of the solution in fighting climate change, the Conference of the Parties decided to integrate land-use, land-use change and forestry (LULUCF) into the Kyoto Protocol at COP 3 in 1997.

1.2.1 Integrating LULUCF into the CDM?

While most stakeholders agreed on the inclusion of LULUCF in national inventories in 1997 (Tyczewski 2006), the question of whether to integrate LULUCF into the CDM of the Kyoto-Protocol was disputed controversially for a long time. Apart from environmental concerns, financial and economic aspects played an important role in the negotiations. Thus, the positive attitude of the JUSCANZ-group (Japan, USA, Canada, New Zealand) towards the integration of LULUCF prior to COP 6 was based on the wish to generate additional emission certificates they could use to meet their emission targets established in the Kyoto Protocol. The EU, on the other hand, tried to avoid the extra certificates to be put on the market for reasons of their global competitiveness and to prevent the USA from shifting from their domestic emission reduction obligations (Tyczewski 2006).

Right from the beginning of the negotiations on the integration of forestry into the CDM, Brazil had been in favour of allowing afforestation and reforestation in the CDM, but opposed the generation of certificates for avoided deforestation: on the one hand, Brazil feared loosing sovereignty in Amazonia due to internationalization processes of avoided deforestation. On the other hand, the Brazilian government was concerned about its ability to actually control deforestation actions (Fearnside 2005). Other Latin American countries, in contrast, demanded to consider the potential of avoided deforestation as a further opportunity to store greenhouse gases, reduce emissions as well as to develop financial mechanisms at international climate policy negotiations (Parker et al. 2009a; Tyczewski 2006). An important step forward towards realizing and concretizing the established goals of the Kyoto Protocol was made at the UN climate change summit in Bonn in 2001

(COP6 bis). Parties agreed on the inclusion of afforestation and reforestation projects in the CDM, but excluded avoided deforestation in order to, inter alia, prevent leakage. Furthermore, COP 6bis decided to restrict the use of certificates from such projects to a maximum of 1% of the Party's base year emissions for each year of the first commitment period. At COP 7 in Marrakesh later on in the same year, definitions of afforestation and reforestation – among other things – were adopted:

Box 3: Definition of Afforestation and Reforestation

> "Afforestation" is the 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;
>
> "Reforestation" is 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.

Source: UNFCCC 2001

1.2.2 Recognition of Carbon Sinks as a Part of the CDM

The final framework for afforestation and reforestation CDM projects was adopted at the UN climate change summit in Milan in 2003, with the exception of special modalities for small-scale afforestation and reforestation projects.

The main issue to solve was the period of validity of emission certificates generated by CDM afforestation and reforestation activities ("A/R CDM"). The problem was the possible removal of greenhouse gases from carbon sinks, e.g. in case of forest fires or infestations of pests. To deal with the non-permanent nature of credits resulting from forestry projects, the COP decided to give emission certificates of carbons sink projects a limited time of validity: parties came up with the idea to generate temporary CERs (tCERs) on the one hand and long-term CERs (lCERs) on the other hand. The crediting period for both types can be either 30 years (non-renewable) or 20 years (renewable twice) and the forest activity cannot be shorter than the chosen crediting period. Besides, after the first verification, for which the moment can be chosen freely, a periodical re-verification has to take place at least every 5 years.

While these rules apply to both types of credits, there are important differences between tCERs and lCERs. Temporary CERs are valid for one commitment period only and expire before the end of the subsequent commitment period. However, after every successful re-verification of the project, new tCERs are issued and the respective parties can replace expired tCERs by newly certified tCERs from the same project until the end of its crediting period. LCERs, in contrast, expire at the end of the project's (last) crediting period. However, they can also loose validity before in case of a negative verification report; in this case, credits need to be replaced immediately (Dutschke 2010). In any case, forestry CERs need to be replaced at some point, at the latest at the end of the project's crediting period. They can therefore be compared to a deferment of pay-

ment.

Parties also debated the possible inclusion of genetically modified organisms (GMOs) as an option of replanting in CDM projects, as well as socio-economic or ecological side effects in general. Overruling concerns about the implied threat to native ecosystems as well as other risks related to the use of GMOs, parties finally agreed to allow the use of genetically modified plants as well as exogenous tree species in CDM projects but obliged project developers to provide information on these topics and other socio-economic or ecological side effects in the Project Design Document (PDD) (Brouns et al. 2003; UNFCCC 2010a).

1.2.3 Current Status of A/R within CDM

At the end of 2005, the first methodology for reforestation was approved. Shortly after, in 2006, TÜV Süd was accredited as the first DOE for validation of A/R projects in 2006. With these preconditions fulfilled, the first A/R-project was registered in that same year. Since then, the CDM Executive Board has registered 16 projects of this type. Despite A/R CDM project numbers slightly rising, overall importance of CDM forestry projects is still comparatively small, representing only 0,43% of the total CDM projects registered (CDM EB Annual Report 2009) and 1,4% of the projects in process of validation (Chenost et al. 2010).

A/R-Projects

The first forestry project registered by the CDM Executive Board was the "Facilitating Reforestation for Guangxi Watershed Management in the Pearl River Basin" project in China, which also developed the first methodology for A/R projects. It aims to sequester carbon allowing local farmers to receive direct benefits from harvesting the plantation as well as from the sale of carbon credits. Thus, additional income is supposed to be generated and other environmental services are supposed to be enhanced (Hamilton et al. 2010; Kägi / Schöne 2005).

Most of the projects are being implemented in tropical areas and overall geographical distribution is relatively balanced: the projects at the moment registered are located each in Albania, Moldova, Vietnam, Ethiopia, Uganda, Paraguay, Peru, Chile, Bolivia and Colombia, two in China, and three in India. These projects are expected to generate sequestration of emissions equivalent to 463,213 tCO_2 per year (UNFCCC 2010b).

A/R-Methodologies

As of May 2010, the CDM Executive Board had approved 17 A/R methodologies consisting of nine large scale, six small scale and two consolidated methodologies. The application of simplified small-scale methodologies is restricted to projects that generate less than 16 tCO_2 per year and are developed or implemented by low-income communities or individuals (UNFCCC 2007a). In addition, several tools are available for tasks such as demonstration of additionality or identification of baseline scenarios.

The methodology to be applied depends on the projects' goals and its baseline scenarios; the latter can be dis-

tinguished by land type (wetland, settlement, grassland, land with inherent low potential to support biomass) and land use (agricultural or pastoral use, unmanaged grasslands in reserves). For the determination of the baseline scenario of A/R projects, several external factors have to be considered, such as price variations of land use products, long term financing conditions for different activities and migration patterns. These factors are difficult to estimate, especially if baseline validity is long (Dutschke 2010).

Out of the total of eight registered large-scale projects, seven use methodologies developed for the afforestation or reforestation of degraded land (in 4 cases AR-AM0003 is used, while AR-AM0001 is used twice and one project applies AR-AM0002). In one case, a methodology for land currently under agricultural use (AR-AM0004) is deployed, while all six small-scale projects use the same simplified methodology (AR-AM-S0001) developed for the application to grasslands or croplands.

The growing number of methodologies facilitates the expansion of afforestation and reforestation projects and advances the number of projects in the pipeline, of which there are now 56 (UNEP Risø 2010). Table 1 shows existing methodologies and their application.

Methodology	Description	Registered Projects
AR-AMS0001	Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands	7
AR-AM0003	Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing	4
AR-AM0001	Reforestation of degraded land	3
AR-AM0004	Reforestation or afforestation of land currently under agricultural use	1
AR-AM0002	Restoration of degraded lands through afforestation/reforestation	1

Table 1: A/R methodologies and projects registered (source: UNFCCC 2010b)

A/R transactions and the demand side of forestry CERs

Looking at the evolution of A/R in the CDM market, the development is not as positive: at the moment, volumes of CDM A/R account for less than 1% of the overall CDM market. In the primary market, forestry projects' share of overall CDM transactions was only 0.01% in 2008, whereas representing about 2% of the voluntary market in that same year, where CDM is used as a quality standard (Chenost et al. 2010; Hamilton et al. 2010).

Potential buyers of forestry CERs are companies and country governments that committed to emission reductions as well as funds who buy the credits on behalf of others. The most important buyers of forestry CDM credits are governments from Annex I countries such as Canada and Japan, but also European governments. Furthermore, the Canadian and Japanese private sector is engaged in acquiring forestry credits (Neeff / Henders 2007). The engagement of the private sector in both countries takes place on a voluntary basis and for pre-compliance. Nevertheless, in Japan, all purchases are accounted for in a national registry and then used to meet Japan's Kyoto target (Hamilton et al. 2010).

By now, no tCERs or lCERs have yet been issued. This is due to the long-term nature of A/R-projects and the time required for relevant growth of plants, leading to verification being undertaken at a later moment and therefore delaying the issuance of credits. Several project developers have signed Emission Reduction Purchase Agreements (ERPAs), exchanged rights to future ownership or received initial payments (Hamilton et al. 2010). In this context, the World Bank is one of the main actors being involved in 6 out of 16 projects now registered. Most forestry credits have been put forward and purchased by its Bio Carbon Fund (Mo 2007).

Crucially, A/R CERs are not eligible in the EU ETS, the world's largest carbon market. The EU had always been rather skeptical towards sinks in the UNFCCC negotiations up to the adoption of the Marrakesh Accords. Apart from methodological problems related to quantifying sinks, the EU was also afraid that governments might make heavy use of sinks for meeting their Kyoto targets instead of taking steps to reduce energy-related and industrial emissions. The EU also argued that sinks offer at best a temporary relieve as the stored carbon may be rereleased into the atmosphere at any time. The EU had hence been strictly against including sinks in the CDM (EU 2000). A further issue is that, as outlined above, to account for the non-permanence of the storage, sink projects in the CDM receive only temporary credits, which expire at the end of the project duration or when the carbon storage is reversed (e.g. by a forest fire) and then need to be replaced with other trading units. Sink CERs are therefore not fully comparable to other CERs or EU Allowances. The inclusion of sinks would therefore have required provisions to take account of this difference.

Along these lines, the European Commission's 2003 proposal for the Linking Directive, which regulates the use of the CDM and JI in the EU ETS, foresaw the exclusion of A/R credits. This proposal was strongly supported by environmental organizations (CAN Europe / Greenpeace / WWF 2003), as well as the European Parliament. The rapporteur of the Parliament's environment committee, Alexander de Roo, reiterated the EU's earlier skepticism regarding the measurability of sink projects and emphasised that sinks were not a permanent solution against climate change (European Parliament 2004).

However, many Members States had in the meantime come to support the use of sinks and some, such as France, Italy and Portugal, explicitly pushed for including sinks in the EU ETS. In addition, business organizations generally rejected the exclusion of any project types that were accepted under the UNFCCC. The proponents of sinks argued that adopting rules that were stricter than those adopted internationally would indicate that the EU had been negotiating in bad faith. In addition, the work of the CDM Executive Board should allay fears about the environmental integrity of the projects. Moreover, limiting the possible types of projects would limit the opportunities for developing countries as well as the flexibility needed by the EU Member States and by the companies participating in EU emissions trading (Europia / OGP 2003).

In the end, the final Linking Directive excluded sinks for the time being but mandated the Commission to consider their inclusion in the future. The issue was taken up again in the negotiations on the EU's climate and energy package of 2008. However, the discussion was mainly a replay of the one held in 2003/2004. The amended emissions trading directive – adopted in December 2008 – still maintains the exclusion of sinks.

Factors hampering development of A/R within CDM

The low number of afforestation and reforestation projects can be attributed to several factors, some of them serving as indicators for the problems a market based REDD mechanism might also be confronted with.

One factor obstructing broader success of A/R projects has been the delay in defining rules for these projects within the UNFCCC. The first methodology for forestry projects was approved by the CDM Executive Board in 2005, more than two years later than for other sectors; one whole year was devoted to the design and approval of this first methodology (World Bank 2010). This along with the fact that carbon sequestration in A/R projects requires a lot of time hindered the inclusion of A/R projects in the compliance market, where time for purchase of credits is very limited, if they are to be of use within the first commitment period of the Kyoto Protocol. (Chenost et al. 2010).

As the EU-ETS excluded forestry CDM credits, overall demand for temporary and long-term CERs from deforestation and afforestation projects is relatively low. Kossoy and Ambrosi even consider the ban from EU ETS to be the main reason for the limited success of A/R CDM projects (Kossoy / Ambrosi 2010). Besides, the cap on the purchase of A/R credits set by the Marrakesh Accords limiting the use of A/R projects to 1 percent of the base year emissions has further reduced the attractiveness of forest CDM credits (Eliasch 2008).

Further problems are caused by the risks attached to forestry credits and the liability placed on the buyers of A/R CDM credits. According to the CDM rules, the party that has purchased the units is responsible for their replacement after their expiry (World Bank 2010). Furthermore, the purchaser of lCERs has to replace these credits if a reversal or removal is detected at verification or if no certification is provided (Eliasch 2008). This problem is increased by the difficulties in estimating the costs for the replacement in the future, which may result in the buyer's decision to purchase permanent CERs in order to reduce the costs attached to risk-assessment. Other difficulties arise with the possibility of losses due to natural events, changes in the institutions involved or unplanned political events in the host country. While some of these problems apply to CDM projects more broadly, with A/R projects they can become factors hindering the demand for expiring credits, due to the buyer's liability in case of expiration (Dutschke 2010).[1]

Moreover, natural dynamics of forests intensify the methodological requirements for A/R projects, as measurement procedures are technologically much more challenging than in other types of projects. Demonstration of land eligibility is costly and demands very specialized knowledge, as DNAs have to select parameters to define forests and specific sustainable development criteria. This has not yet been done in several CDM host countries. Additionally to technological and biological knowledge, the project developer may also require assistance in legal aspects as the implementation of the projects can lead to problems with regard to land-ownership. This is due to the CDM rules which require determining the legal title to the land. In some cases this may be related to actual and use rights as well as customary rights, demanding strong cooperation with local authorities (Chenost et al. 2010).

[1] Note that the liability issue only arises at the moment of verification. Hence, CERs are free of risk during the commitment period in which they are issued (Dutschke 2010).

Lessons learnt from A/R CDM

Today, the technical and methodological obstacles to the development of forestry projects seem to have been overcome. Several methodologies and tools have been developed to help assist project developers in dealing with the numerous challenges attached to this project type.

Elements hindering further development of A/R projects continue to be the lack of demand for the credits resulting from these projects. While they have been broadly accepted in voluntary markets, demand for A/R CERs in the primary CDM market is still comparatively low. Some central factors can be identified here: Delay in the definition of rules and methodologies and the fact that generation of credits in forestry projects is much more time-consuming discouraged buyers of CERs to opt for A/R projects. More generally, afforestation and reforestation projects require long-term planning and are exposed to several natural and institutional risks, which partly have to be assumed by the purchaser of the certificates. These insecurities have to be taken into consideration to make this project type more compatible with the requirements of the buyers at the compliance market.

Besides these difficulties in integrating forestry projects into market dynamics, it is important to emphasize that these projects differ clearly from any other mitigation activity due to their natural dynamic and interrelatedness with other human activities. The challenges in measurement und predictability highlight the importance of proper political regulation and an adequate distribution of liability. This is also crucial to reduce the risk of deferring mitigation efforts in other sectors (industry, transport, households) through the promotion of forest activities.

2 REDD: Concepts and Policy Options on Reducing Deforestation

2.1 Basic Determinants

The main idea of a REDD mechanism is that developed countries pay developing countries money for not destroying or degrading their forests in order to prevent further GHGs emissions. However, there are a lot of interconnected methodological and technical questions still to be answered which will determine the effectiveness, efficiency and equity of such a mechanism. Thus, the mechanism's scope has not been determined yet even though REDD+ seems to be favoured by most Parties. Besides, there are discussions about different options regarding reference levels current emissions can be measured against. Another important question is how to finance REDD. There are different suggestions such as a market-based approach or voluntary financing from public or private funding. In the following, debates on REDD, the current state of options as well as positions of the Parties and NGOs are illustrated.

2.1.1 Deciding on the Scope

Debates in international climate negotiations concerning the scope deal with the question of whether to opt for REDD, REDD+ or REDD++. The scope of implementation determines what is being delivered in REDD, REDD+ and REDD++ respectively. Different activities are considered eligible in reducing emissions from deforestation and degradation (REDD) or additionally from the conservation, sustainable management of forests and the enhancement of carbons stocks (REDD+) or even from broader agriculture, forestry and other land use (REDD++), cp. section 1.1.

Deforestation, the direct human-induced conversion of forested land to non-forested land, leads to a large change of carbon stocks in a short time period because releasing GHGs in the atmosphere due to deforestation is a quick process. In a broader sense, avoided deforestation means maintaining the forest. Maintaining the forest also includes reforestation, i.e. plantations after deforestation actions which help avoiding the net-loss of forest area (The Forest Carbon Partnership Facility 2010).

30% of emissions of the forest sector stem from forest degradation. There is no consensus of whether or not to run land use conversions, e.g. by creating plantations, under degradation since plantations lead to an increase of tree cover but reduce biodiversity. Nevertheless, the UNFCCC uses canopy cover as an indicator for degradation. So far, the UNFCCC has not agreed on a definition of forest degradation. A definition of forest degradation of the Food and Agriculture Organization of the United Nation (FAO) is given in the textbox below (Annex 6 of the Asia-Pacific Forestry Commission 2000).

Box 4: Definition of Forest Degradation

> Changes within the forest class (from closed to open forest), which negatively affect the stand or site and, in particular, that lower the biological productivity capacity and diversity.

Source: Asia-Pacific Forestry Commission 2000

Degradation does not lead to a reduction of forest area but to a reduction of its quality. The UNFCCC defines a forest as an area with a crown cover of >10%. This implies forest degradation to be a forest destruction of up to 90% of the forest. In the majority of cases, forest degradation finally leads to deforestation. Sources of emissions of degradation are timber harvesting, fire and fuelwood harvesting. Degradation has a negative impact on different forest ecosystem components, the interaction between these components and its functioning. Stopping degradation leads to an intact forest and supports biodiversity. There are difficulties in measuring forest degradation regarding criteria and reference levels (Lanly 2003; The Nature Conservancy 2009).

REDD+ additionally accounts for the removal of greenhouse gases from the atmosphere using carbon stocks as a mitigation strategy (Angelsen et al. 2009; Parker et al. 2009a). REDD+ is an enhanced action on mitigation which emphasizes the role of conservation and includes the protection of forests, the maintenance of biodiversity and ecosystems as well as sustainable forest management (SFM).

Box 5: Definition of Forest Management

> "Forest management" is a system of practices for stewardship and use of forest land aimed at fulfilling relevant ecological (including biological diversity), economic and social functions of the forest in a sustainable manner

Source: UNFCCC 2001

Both REDD and REDD+ can be used as a mitigation option. By decreasing deforestation and degradation and including sustainable forest management it conserves water resources, prevents flooding and run-off. It can control soil erosion, reduce river siltation, preserve biodiversity and support forest-dependent people (The Forest Carbon Partnership Facility 2010).

Besides that, some countries want REDD to be incorporated in a broader agriculture, forestry and other land use (AFOLU) programme. The idea is to also reduce emissions in sectors such as agriculture, e.g. from rice production or biofuels. That means to extend REDD+ to the so called REDD++ and possibly widen it for all Parties. The discussions are still at the initial stage. Due to the fact that no preliminary decisions regarding REDD+ mechanisms have yet been made, experts do not expect an agreement on the topic in the near future (Lasco 2009; Parker et al. 2009a; Verchot / Petkova 2009).

Positions of the Parties and NGOs

Speaking of the scope, proposals from various governments and NGOs show great support for the inclusion of deforestation as well as forest degradation in REDD. Most countries agreed on referring to developing countries only when speaking of REDD+. A general problem is that the suggested scopes are not defined clearly in the submissions (Parker et al. 2009a; Verchot / Petkova 2009).

The EU, USA, Japan, Australia, Norway, China, India, Indonesia, CfRN (Coalition of Rainforest Nations) as well as Colombia, Mexico and Panama are in favour of expanding the scope to REDD+ thus including carbon enhancement activities. Implementation is supposed to follow a phased approach, meaning a staggered implementation starting with REDD and ending with REDD+. A staggered approach would provide a politically feasible negotiation basis under the UNFCCC and also allows participants to build capacity in carbon accounting practice. The Alliance of Small Island States (AOSIS), Brazil, as well as Malaysia call for a restriction to REDD without the carbon stock enhancement component, mainly because they want to focus on decreasing additions of carbon into the atmosphere.

NGOs are divided on whether to implement REDD or REDD+. Greenpeace, supported by research institutions such as the Center for Clean Air Policy (CCAP) and the Tropical Agricultural Research and Higher Eductation Center (CATIE) call for REDD. Others, like the Human Society International (HSI) and the Terrestrial Carbon Group (TCG), an international land management think tank approve REDD+. While HSI regards REDD+ as a means to contribute to protecting biodiversity, Greenpeace, in contrast, sees in REDD+ a threat to terrestrial biodiversity if it includes afforestation, reforestation or sustainable forest management. Greenpeace argues that REDD should focus on primary forests, which according to them, contain the greatest carbon stocks, harbour the highest biodiversity, and have the highest resilience to climate change. Greenpeace furthermore argues for a distinction between forest and plantations, and calls for the latter to be excluded (Greenpeace International 2009).

2.1.2 Determining the Reference Level

To measure and where applicable, reward changes of carbon flux caused by REDD mechanisms, a reference benchmark scenario is needed against which future emissions of GHGs can be compared. Such a reference level may equal the business as usual (BAU) scenario but may as well be set below BAU levels to yield additional emission reductions. There are different ways to determine reference levels regarding reference periods and spatial extents. All methods, however, involve a high level of uncertainty due to technical and methodological imperfections that still exist in the accounting of forest emissions and the assessment of BAU developments.

The potential reference periods are either a historical, historical adjusted or projected baseline. The historical baseline refers to a period of time, e.g. between 1990 and 2005, where the amount of GHG emissions caused by deforestation has been measured. If the current amount is less compared to the historical baseline, emission reductions can be considered to be additional and can be awarded with incentive payment. Problems exist regarding countries which lack in quantity of quality of historical data as well as regarding the fact that a historical baseline does not recognise changes in deforestation rates e.g. due to changing country circumstances over time.

The historical adjusted baseline takes these problems into account by adding a development adjustment factor (DAF) which reflects predicted changes in future drivers of deforestation. That means the historical adjusted baseline can either be adjusted above or below the historical baseline using the DAF. Any amount of emissions that are below the benchmark can be considered as reduced emissions. Since there is the possibility to create an even higher baseline due to a positive DAF compared to historical emissions, there is a threat of so called "hot air" which implies an actual increase of the average current emissions compared to the past. This occurs when the current amount of emissions is below the positive adjusted baseline and implies that current emissions can still be above historical emissions thus resulting in an actual increase of GHGs in the atmosphere. Thus, a conservative approach is of great importance in forecasting baselines.

The third option, the projected baseline, uses econometric models with various socio-economic or structural drivers to predict how rates of deforestation might develop in the future. Here, the accuracy of data needed for key variables as well as the difficulty of discussion on such a complex methodology in international negotiations such as those under the UNFCCC are the great challenges of this option. Also, this approach includes the high risk to create 'hot air' since baseline calculations can predict reality to a limited extent only (Parker et al. 2009a).

Furthermore, the spatial extent of the reference level determines its environmental effectiveness, economic efficiency and equity. A reference level and its specific carbon accounting mechanism can be set subnationally, nationally or globally. In particular, the levels of leakage, i.e. reductions in emissions in one area causing increases in emissions in another, heavily depend on the choice of reference level. Generally, the smaller the scale, the bigger the risk of leakage.

Subnational reference levels for a defined geographical area or at project scale give developing countries and communities that do not have the capacity for national carbon accounting systems the chance to nevertheless participate in REDD. They are, however, especially vulnerable to leakage and involve higher transaction costs. A national scale results in a stronger involvement of national governments, has the ability to influence long-term development policies and considers the concerns of intra-national leakage, the potential to achieve large-scale reductions as well as the protection of national sovereignty. Moreover, it is cost effective and may result in lower transaction costs through economies of scale. International leakage, however, remains a problem. A 'nested approach', which integrates subnational activities into a national accounting framework, provides incentives for sub-national and national projects. The idea is to establish a transitional mechanism, which offers the opportunity to scale up reference levels in the course of time.

If REDD is established in one area but not implemented in the adjoining territory, there is always the possibility of leakage. Global reference levels therefore try to avoid leakage by considering the average deforestation and degradation on Earth. They would also solve the problem of concerns of countries with historically low rates of deforestation since their emissions would easily be below the global average. (Angelsen et al. 2008; Eliasch 2008; Parker et al. 2009a).

Positions of the Parties and NGOs

The majority of Parties like the EU, USA, Brazil, China and other developing countries are in favour of a national baseline, although some of the latter as Colombia and AOSIS (Alliance of Small Island States) also speak of a sub-national baseline. The EU wants an implementation based on a national scale to prevent leakage, which reflects the general attitude of Parties. A national baseline seems to be feasible and offers wide-

spread participation. Most of the countries appreciate the idea of a scaled up approach also associated with financing mechanisms (Parker et al. 2009a).

NGOs are more divided. Greenpeace, CCAP (Centre for Clean Air Policy) and TCG (Terrestrial Carbon Group) are in favour of a national baseline compared to CATIE (Tropical Agricultural Research and Higher Education Centre), EDF (Environmental Defence Fund) and HSI (Human Society International) which also consider sub-national baselines as more suitable in order to integrate local communities and indigenous peoples.

The opinions concerning the reference period are in general more divided. The EU, Norway, USA, Canada and most of the developing countries agree on a historical adjusted baseline, which means taking into account national circumstances. Furthermore, negotiations are needed to update the baseline periodically e.g. adjust downwards. Yet, the term 'baseline' is not defined uniformly so that many proposals lack clarity and are difficult to compare (Griscom et al. 2009; Verchot / Petkova 2009).

The majority of NGOs as well as Brazil, India, and Indonesia want to implement REDD on the basis of historical baselines. They argue that a historical baseline shows the actual reduction compared to the past. It also is the simplest methodology to calculate emissions (Parker et al. 2009a).

An unsolved option is whether to establish a global historically baseline in order to reward 'high forest low deforestation' (HFLD) countries considering the distribution of funds and ensure additionality of REDD (Verchot / Petkova 2009).

2.1.3 Addressing Measuring, Monitoring and Leakage Issues

Carbon emissions from deforestation and forest degradation arise from changes in **two variables:** changes in the spatial extension of forests and changes of the amount of carbon stored in these forests. Depending on the degree of change (major changes such as deforestation or smaller modifications like degradation), national circumstances and availability of data, different methodological approaches may be suitable to best measure and monitor these changes.

To estimate the emissions released as a result of **deforestation**, the specific land use change that has taken place has to be monitored in addition to the overall reduction in forest size. In principle, deforestation areas and different land uses can be monitored effectively using remote sensing methods such as satellite technology or aerial photography. The information obtained can then be combined with data on the carbon stored in order to estimate the resulting emissions (Eliasch 2008).

By contrast, forest **degradation** is much more difficult to measure and information about the type and the extent of degradation is required to estimate resulting emissions. Through a combination of satellite and groundwork approaches, the ability to detect degradation has improved considerably in the last years, but further research is needed to reduce costs and improve measuring certainty (Murdiyarso et al. 2008).

Integrating MRV in a REDD scheme

In the discussions on Measuring, Reporting, and Verification (MRV) of a future REDD scheme, Parties agree that reference emissions and reference levels need to be established and verified, a common methodology should be used and national forest monitoring systems and ex-post verification are both necessary (Verchot /

Petkova 2009). Despite these common views, some issues around MRV are still being hotly debated, as official guidance for REDD MRV is yet to be established.[2] Existing IPCC guidelines provide methodologies that can serve as basis for how emissions from REDD can be monitored and estimated[3].

One question to be agreed on concerns the **carbon pools** to be included in a monitoring system, i.e. aboveground or belowground biomass, litter, dead wood and soil organic carbon. Option number one would require all countries to include all five of these carbon pools. This would demand high capabilities and implementation would require significant financial resources. A second option would allow countries to decide which pools to include. This more cost-effective option would have to ensure the conservativeness of the choices (Angelsen et al. 2009).

A second issue relates to the **methodologies** that can be used to estimate emissions from deforestation and forest degradation. The IPCC developed **two approaches to estimate carbon stock changes**: the stock-difference approach, which estimates the difference in carbon stocks of a defined carbon pool at two moments in time, and the gain-loss approach, estimating the balance of additions to and removals from a carbon pool. Which method to be used will ultimately depend on data availability, the resources to collect additional data as well as country specific deforestation and degradation rates (Wertz-Kannounikoff / Verchot 2008; Murdiyarso et al. 2008).

To ensure that emission reductions are additional and long-lasting, **review and verification** of forest emissions is of crucial importance. However, no consensus has yet emerged whether verification should occur at the international level or if actions should be verified by national entities in accordance with national procedures. A possible solution to this problem would be that verification is being carried out at national level, but in accordance with international guidelines (Verchot / Petkova 2009). Generally, the use of satellite data provides potentially high degrees of transparency that is not possible in other emitting sectors (Eliasch 2008).

Implication of country circumstances for MRV

As described above, the last years have shown significant progress concerning the technical aspects of carbon accounting. However, many developing countries currently have little or no data available and lack technical infrastructure as well as capacities for transparent, consistent data analysis and management for establishing a national forest inventory (Wertz-Kannounikoff / Verchot 2008). These capacity gaps are largest in countries with limited experience in estimating and reporting national GHG inventories and who are not familiar with IPCCC guidelines, making it difficult for them to meet the general UNFCCC reporting principles[4]. In particular, the principles of completeness and accuracy will represent mayor challenges for several developing countries, as they imply the application of country specific data[5] for key categories and important pools (Angelsen et al. 2009). Therefore, capacity building programmes by countries that already apply methods with high levels of accuracy are needed to support those countries (Herold / Skutsch 2009).

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2 The adhoc REDD working group GOFC-GOLD (Global Observation of Forest and Land Cover Dynamics), which has been proposed and initiated by the Committee on Earth Observation Satellites (CEOS), is developing a sourcebook on methodological issues. The current 4th version is available under: http://www.gofc-gold.uni-jena.de/redd/.

3 IPCCC developed two guidances: The Good Practice Guidelines for Land-Use, Land-Use Change and Forestry (GPG-LULUCF) and Guidelines for National Greenhouse Gas Inventories for Agriculture, Forestry and Other Land Use (GL-AFOLU).

4 Transparency, consistency, comparability, completeness and accuracy.

5 The IPCC proposes three different Tiers with increasing level of data requirements and complexity and therefore improved accuracy.

Another possibility to deal with the capacity shortcomings would be establishing an independent international institution for monitoring forest emissions that could build synergies with UNFCCC institutions in addressing REDD monitoring requirements. Third party monitoring in the form of an international forest carbon monitoring institution represents another, more cost-effective alternative in dealing with the lack of capacity at national level (Wertz-Kannounikoff / Verchot 2008).

In cases where countries can only implement an accounting scheme with lower levels of accuracy, a set of simple interim indicators based on the principle of conservativeness may be used in cases of incomplete and uncertain data until effective institutions, technology and capacity for monitoring and measuring have been established. This would reduce the risks of excluding countries with currently weak MRV structures, while promoting the use of approaches with higher accuracy and lower uncertainty (Herold / Skutch 2009).

In the short term, measuring and monitoring could also be implemented at a subnational level using guidance of the IPCC GPG involving similar methods than those described at national level. However, subnational measuring and monitoring is associated with higher leakage risks (Eliasch 2008).

Dealing with Leakage and Permanence

Leakage can occur within one country or across countries as well as among different land activities (the shift from deforestation to degradation). The potential scale of REDD leakage is generally assumed to be substantial for both, intra-national and international leakage (Murray 2008).

The problem of leakage is intrinsically linked to the spatial extent of the reference level (cf. chapter 2.1.2), as the risk of leakage is generally higher if scale is small. Therefore, **increasing the scale** from subnational **to national levels** is widely seen as the key to control leakage. International leakage can be addressed through ensuring that a maximum number of countries participate in the mechanism. Since country participation may also depend on favourable rules for these countries in the REDD scheme, this comes with the risk of baseline inflation and over crediting of reductions, making it vital to strike a balance ensuring maximum participation of countries while safeguarding environmental integrity (Murray 2008).

In order to deal with the risks of **intra-national leakage** of projects implemented at a subnational level, **areas outside of the project boundaries can be monitored**. If monitoring is done at national level, intra-national leakage can be effectively controlled, especially if the so-called wall-to-wall coverage is used (Wunder 2009).

As long as country participation remains below a certain threshold and the risk of international leakage is high, **discounting REDD benefits** or **banking of "reserve credits"** may be an option to ensure that only net emissions are rewarded (Wunder 2009).

It is important to make sure that emission reductions are **permanent** and not just postponed for a short period of time. While permanence risks always apply, a second risk arises if REDD mechanisms are to be credited and traded. This problem, already known from the introduction of afforestation and reforestation projects into the CDM, can be tackled through **temporary crediting, insurance, liability** and several other approaches. While some of these approaches have already been discussed in the context of the integration of forestry projects into the CDM, they may be worth reconsidering as the timeframe for mitigation action is much clearer now (Dutschke / Angelsen 2008). With these options at hand and having learned from the experience with A/R in CDM, the risk of non-permanence may be much easier to approach now (cf. chapter

1.2).

Party Positions

As briefly described above, several issues on MRV as well as questions on how to deal with leakage/permanence remain open to discussion and party positions differ somewhat. Concerning monitoring of emissions in a future REDD scheme, Brazil argues for intensified use of remote sensing while the EU and Nepal would like to see remote sensing combined with on the ground measuring. In relation to whether full or partial accounting should be applied, Brazil and New Zealand are in favour of wall-to-wall mapping, with Indonesia and several[6] Latin American countries advocating sampling monitoring methods.

While generally strong support exists for the international bodies within the IPCC/UNFCCC to define the methods for MRV, the positions in relation to verification are more divided: Colombia, Chile, Argentina, Norway and others support an independent and accredited verification system to determine reference emissions levels, emission reductions and leakage, whereas Indonesia is calling for a stronger role of national institutional mechanisms (Guizol / Admadja 2008).

2.1.4 Safeguarding Biodiversity Protection and Ensuring the Respect of the Rights of Indigenous Peoples

The design of a possible REDD scheme can have major impacts on indigenous peoples and other forest-dependent communities (referred to henceforth as "forest communities"), for example through violating customary land rights and subsequent loss of income. The inclusion of REDD into the global climate regime has therefore raised both concerns and expectations.

On the one hand, the additional (commercial) value REDD is adding to forests could create incentives for governments and businesses to ignore the rights of forest communities to access and control forest resources. Exclusionary models of forest conservation could be implemented and land speculation, land grabbing and conflicts may result from the emerging interest in the forests of developing countries (Brown et al. 2008). On the other hand, REDD offers the opportunity to further strengthen and advance the rights of forest communities, improve their wellbeing and enhance governance. Climate related investments could reduce local poverty and moderate existing economic disparities if channeled adequately (White et al. 2010).

Introducing safeguards in the legal text of a REDD agreement

One option to promote the participation of forest communities in REDD and protect their rights consists in the inclusion of specific principles and guidelines in the REDD legal text ("safeguards"). These include references to rights of indigenous peoples and local communities by, inter alia, **linking REDD to existing international agreements**[7] that articulate obligations to protect human rights, providing forest communities with international legal instruments.

Guidelines of the REDD agreement may refer to **procedural aspects** such as the establishment of public

[6] Colombia, Chile, Paraguay, Argentina, Honduras, Panama and Peru.

[7] International human rights instruments relevant to REDD include the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the International Convenant on Economic, Social and Cultural Rights, the International Convenant on Civil and Political Rights, and The Convention on Elimination of All Forms of Discrimination of Women

consultation procedures and strengthening of local organizations that represent the interests of forest communities. To further secure the respect of rights of forest communities an **appeals mechanism** could be established giving non-state actors the possibility to submit a complaint if established international REDD standards have been violated by national authorities or through the implementation of REDD activities at the international level (Angelsen et al. 2009).

Choosing the appropriate REDD design options

Whether poor forest communities benefit from REDD ultimately depends, among other things, on the **scope** chosen for the design of the mechanism. A broader scope that includes degradation as well as deforestation could significantly expand the coverage of REDD and may result in benefits for carbon conserving activities of the poor and achieve a higher financial volume. On the other hand, if practices (such as shifting cultivation and selective harvesting), which are considered to degrade forests, are included in the definition of degradation, they could oppress activities with important benefits for the poor without adequate compensation. The same is true for the **definition of forests**, as a narrow definition could exclude categories which potentially offer important benefits for the poor (Brown et al. 2008; Pesket et al. 2008).

In relation to the **scale** it can be stated that subnational approaches may be more compatible with the application of safeguards and other instruments for monitoring and verification of impacts on human rights and livelihoods. Financial flows and equitable distribution of benefits could be easier to control if payments are received and accounted for at project level. Participation of forest communities would, however, depend on transaction costs and procedures. National approaches, on the other hand, offer greater opportunities to improve forest governance, for example, through the implementation of broad forest tenure reforms. Furthermore, financial flows could be harmonized with national development strategies. Their greater potential to influence the policy environment nonetheless comes with the risk of being more vulnerable to governance failures and corruption and is dependent on the effectiveness of decentralization processes (Brown et al. 2008; Pesket et al. 2008).

Access of forest communities to international financial resources can be either achieved through **markets or fund** mechanisms. Markets are assumed to generate higher levels of finance in the long run – cp. chapter 2.2, while additional support for local institutions and civil society groups, inter alia, is needed to enable participation of local communities. Fund-based approaches on the other hand may be more flexible in terms of design and could make social co-benefits easier to achieve. In both cases the participation of forest communities is dependent on the authorization of the national government (Angelsen et al. 2009).

Monitoring is one important instrument for promoting the participation of forest communities and the safeguarding of their rights as well as to control the effects of REDD on their livelihood. By "monitoring more than carbon" the impacts of REDD on human rights and governance can be assessed. Results obtained could be used to induce modifications on the scheme and its implementation (White et al. 2009).

Safeguarding and advancing biodiversity and other ecosystem services

The large and stable financial flows REDD is expected to generate offer new possibilities for the conservation of forests, which is considered to have been significantly underfunded in the last decades. Generally, any future REDD mechanism that aims at reducing emissions from deforestation and forest degradation is expected to have significant positive effects on biodiversity as a decline of these activities implies a decline of hab-

itat destruction und biodiversity loss (Karousakis 2009, CBD 2009). Nevertheless, the design of the future mechanism may have major implications for achieving biodiversity co-benefits and avoiding potential negative impacts on biodiversity.

Options referring to the legal text of a REDD agreement

To maintain major ecosystems the coordination of efforts at a national scale is needed, which might be beyond the scope of an agreement focused on mitigation of carbon emissions. However, several international agreements, among them the Convention on Biological Diversity (CBD), [8] are relevant for REDD and push for harmonization with broader environmental objectives. Furthermore, establishing biodiversity standards for REDD will have important effects on the impact of the projects, although this will lead to increased costs (Brown et al. 2008; Brown / Pesket 2008).

REDD-design options

The **scope and the definition of forests** represent key design elements of REDD in relation to the aim of safeguarding and promoting biodiversity. Addressing both deforestation and degradation activities will generally result in biodiversity co-benefits and could have also positive effects on soil and water quality (Brown et al. 2008). A REDD+ mechanism that also encompasses conservation, sustainable forest management and enhancement of carbon stocks could have further positive impacts for preserving biodiversity. This, however, is not necessarily true for all activities that aim at the enhancement of carbon stocks. Afforestation and reforestation activities can lead to biodiversity benefits if previously deforested areas are reforested adequately using an appropriate mix of native species. If, in contrast, A/R activities result in mono-plantations and non-endemic species are used, adverse impacts on biodiversity are likely to occur (Karousakis 2009). Therefore, appropriate definitions of forest and forest-related activities of REDD are necessary in order to ensure that natural forests and other ecosystems are not converted into plantations with low biodiversity value. While restoration could be integrated in a REDD+ mechanism, commercial plantations may be excluded as they can threaten the overall environmental integrity of the mechanism (Pistorius 2009).

In terms of protecting and enhancing biodiversity, a national **scale** is generally preferable to a project-based mechanism as a more coherent approach for landscape planning can be established and biodiversity leakage can be better controlled. However, despite the higher risk of leakage, projects at the subnational level can be beneficial for biodiversity as well, especially if specific areas with high biodiversity value are targeted. The choice of scale will have implications on who may be able to include biodiversity considerations into the implementation of REDD activities. With a national scale this possibility falls to the host countries' governments while the investor or fund manager if REDD will have the possibility to include biodiversity considerations if implemented at a subnational scale (Brown et al. 2008, Karousakis 2009).

The different **financing options** may also have significant implications for biodiversity. A market-based mechanism will probably direct funding to areas of high carbon emissions, in order to generate a maximum of emission reductions and removals. But these areas must not necessarily be the areas with the highest biological diversity. Fund-based approaches may therefore be better suited to target specific areas with high biodiversity. On the other hand, a fund-based approach is expected to mobilize lower levels of funding, cp.

[8] Relevant international environmental agreements apart from the CBD include the UN Convention to Combat Desertification and the Ramsar Convention on Wetlands.

the following section. Therefore, it is expected to cover a smaller area of forest, which implies less biodiversity co-benefits. Thus, there is a trade-off between geographical targeting of funds to areas of high biodiversity and the overall amount of finance available (Brown et al. 2008; Brown / Pesket 2008).

2.2 Financing Options

Research on the cost of avoided deforestation remains preliminary. The Stern Review calculated costs for bringing down deforestation by 70% in eight tropical REDD countries, yielding a range from US$ 5-10 billion annually (Stern et al. 2006). The more REDD-focused Eliasch Report developed an estimate of US$ 17-33 billion annually needed to halve GHG emissions from deforestation by 2030 (Eliasch 2008). An overview of different cost estimations is given in Table 2. The Eliasch Report states that the $33 billion figure indicated at the upper end of the range for halving emissions from the forest sector by 2030 would translate into average carbon prices of $15/tCO$_2$ while a lower figure of $22 would lead to a price of $11/tCO$_2$ (Eliasch 2008: 75).

Target	Scale (US$ billion/a)	Source
Deforestation 25% Reduction		
by 2015 (USD 22-37 over 5 years)	4-7	IWG-IFR (2009)
Deforestation 50% Reduction		
by 2030 (65% reduction)	10.4	Blaser / Rebledo (2007)
by 2030	17-33	Eliasch Review (2008)
by 2030	17.2-28	Kindermann et al. (2008)
by 2020	22.5-37.5	European Commission (2008)
by 2025	33.5	Obersteiner et al. (2006)
Deforestation Elimination		
in 8 countries	5-10	Greig Gran (2008) (Stern review)
by 2030	12.2	Blaser / Robledo (2008)
top 20 countries 95% reduction	30	Strassburg et al (2008)
by 2100	25-185	Sathaye et al. (2007)

Table 2: Avoided Deforestation Cost Estimates; Source: adapted from Parker et al. 2009b

The following section looks at possible ways of financing as well as distributing REDD resources. The main focus is on the question whether the income stream for REDD should be generated by a public fund or through a market mechanism with tradable certificates.

The two basic financing options currently being discussed are

a) A **fund-based model**, which could comprise contributions from both governments and businesses to a REDD fund, which in turn would distribute rewards in proportion to emissions reductions achieved.

b) A **REDD market mechanism**, where (tradable) credits would be generated by reductions either on a national or regional / project level measured against a reference scenario.

There are also proposals combining these two models, i.e. starting with a Deforestation Fund and gradually

allowing market actors to come in ("phased approach"). Other proposals suggest combining activities a both project and national levels including private and public actors respectively ("nested approach", CIFOR). In fact, even some "pure" fund-based approaches include market elements, for example earning revenues from taxes, which are then earmarked for REDD ("market-linked"). Examples for the latter are the Norwegian proposal to auction Assigned Amount Units (AAUs), but also the German International Climate Initiative, which uses revenues from auctioning EU allowances for climate protection activities.

The two different REDD options on financing and the most prominent corresponding proposals are described in the following. In general, there is a large number of different approaches being discussed. Within the scope of this paper, only a few of them can be briefly explained; an overview of all suggested mechanisms can be found in Parker et. al (2009a). Unfortunately, not every aspect of a possible archicture is laid out in every proposal, which makes them difficult to compare at times.

2.2.1 The Fund-based Approach

Fund-based approaches would rely on donors from developed countries, which could make (voluntary or mandatory) contributions to one or different funds. Resources would then be distributed from the fund to deforestation activities. The recipients of the rewards could be national or regional governments or private actors carrying out REDD activities, depending on the reference level chosen. Some of the proposed funds would be dedicated to specific tasks, such as capacity building, governance, or monitoring activities. An important feature is that emission reductions created by voluntary funding cannot be used to meet domestic reduction targets of developed countries.

Brazil is one of the main proponents of the fund-based approach. In 2006, at a UNFCCC Workshop dedicated to REDD, Brazil proposed a **voluntary fund** as a means to generate REDD funding. This proposal was further detailed in the following years (Dutschke 2010). The suggested fund is to issue compensation if countries stayed below a certain deforestation level. If deforestation remained above it, the country could then compensate these emissions in a subsequent commitment period. This concept became known as the Brazilian proposal. One of the main features of this proposal is that payments would be issued only after a deviation from the agreed baseline can be demonstrated. Financial resources would come from (additional) voluntary contributions from Annex I countries, possibly including both governments and businesses (ibid). The scope of this voluntary fund would be restricted to deforestation.

Several other proposals on REDD-Funds have been made, see also section 2.2.3. The so-called **Stabilsation fund** as proposed by a number of Central African Countries, for example, targets deforestation and forest degradation. The baseline would be based on a historical data plus a development factor, reference level could be both national or on a project level. Funding could be generated via voluntary contributions, but also through (international) taxes or levies on the international carbon market (Ogonowski et al. 2007).

All proposals differ in terms of scope, reference level, financing and distribution, as well as governance and eligibility, which makes them difficult to compare. In general, the main differences occur regarding the **financing** aspect ("where does the money come from?"). Here, approaches range from voluntary contributions including earmarking of revenues from auctioning of domestic allowances (cp. US / EU ETS) to market-linked international levies, p.ex. on the sale of AAUs or taxes (Angelsen et al. 2008). On the **governance** side, many proposals include the idea of an international board under the guidance and authority of the COP, as, for example, is in the Adaptation Fund Board. A REDD Fund Board would include representatives from

REDD countries as well as donor countries, plus representation by NGOs and indigeneous peoples organisation. The Board would upgrade or downgrade participating countries, thus making them eligible for more or less REDD funding, and oversee monitoring mechanisms (Angelsen et al. 2008). Different **modes of distribution** are being disscussed, such as transferring funds directly to national government accounts, establishing special national agencies, implementing projects through multilateral institutions such as the GEF, or distributing resources directly to different recipients in-country (Verchot / Petkova 2009).

Currently, there is a wide range of **prototype institutional arrangements** preparing the ground for REDD, which are organised as funds, p.ex. the Forest Carbon Partnership Facility of the World Bank (FCPF) or the UN-REDD-Programme, as well as other bilateral agreements. The latter is a collaboration between FAO, UNDP and UNEP and was set up after COP 13 in Bali. These existing initiatives could serve as a starting point of a newly introduced fund under the COP, in case this financing and distribution option was chosen.

2.2.2 Market Approaches

If and what role carbon markets could play in a future REDD regime is subject to a number of different proposals and concepts. In principle, market solutions would enable developing countries to reduce their deforestation rate by voluntary actions, which would generate **carbon credits**. These REDD credits could then be sold at market-prices per tonne CO_2-reduced. This market mechanism could be either linked to existing or future carbon markets and could then be traded within these systems, with different options for limiting exchange processes. Some proposals envisage a REDD market separate from the post 2012 carbon market, such as the Dual Markets Approach of the Center for Clean Air Policy, see below (Ogonowski et al. 2007).

As for a general architecture of market approaches, **two basic scenarios** under the frame of the UNFCCC can be distinguished (EcoSecurities 2007):

- National crediting, based on a corresponding national baseline / reference level
- Project crediting, based on project-specific or national baselines

Another scenario, which is not discussed here would be – in absence of a global climate agreement – the continuity of the already existing voluntary REDD market.

A further important distinction comprises the choice of the **market design** (Verchot / Petkova 2009): under a **sectoral baseline and credit** system emissions reductions would be measured against a reference level and REDD credits would be issued ex post. In a **sectoral cap and trade** system REDD credits would be issued ex ante. The credits would again be based on an agreed reference level. A REDD country could then sell these credits in order to raise funds or allocate credits for sub-national levels.

There are only a few proposals in favour of a pure market solution. In fact, most proposals suggest some restrictions or combinations with other options.

The **Dual Markets Approach**, for example, opts for separate markets. The proposed REDD system would create a new market completely separated and independent from the post 2012 global carbon market. Annex I countries would fulfil a part of their overall reduction commitment with credits stemming from REDD projects (Ogonowski et al. 2007). This goal, for example 5%, would be set by the COP. Annex I countries would state at the beginning of the commitment period from which REDD countries they were going to buy the reductions, with the option to change to other countries in later periods. In case the reductions do not material-

ise, Annex I countries could shift these obligations at the end of the commitment periods to other mechanisms, such as the CDM; another option would be borrowing REDD credits from a future period. Developing countries would establish and report national LULUCF inventories annually. Baseline would be determined, if possible, at the national level. The COP would assess the dual system after each commitment period with a view to possibly raising the maximum of Annex I obligations to buy REDD credits. Eventually, the two markets could also be linked. The Centre for Clean Air Policy, which developed the system expects that it could leverage significantly more investment than a fund-based approach with voluntary contributions, also by involving the private sector, and it would give the market time to develop and stabilize. Further, it would encourage long-term policy solutions addressing REDD at the national level, as REDD countries would compete in producing quality programs (Ogonowski et al. 2007).

The so-called **Nested Approach** suggests the creation of a double baseline-and-credit system, which would comprise both a national and a sub-national / project-based approach (Pedroni et al. 2008). The proposal is based on the assumption that accounting and policy implementation at the national level does take a significant amount of time; therefore, it is suggested that project-level activities are to go ahead and be integrated in a national-level accounting system, which is being built up while the first sub-national activities are already going on. Once a certain threshold of sub-national activities would be reached, the country would be required to fully switch to a full national accounting scheme. (Karousakis / Corfee-Morlot 2007). The main advantages here are again private sector investment as well giving incentives to early action by REDD countries, even if they are not ready for a national approach yet.

The **Hybrid Model** developed by Greenpeace is a market-linked system. It foresees the creation of a new currency, Tropical Deforestation Emission Reduction Units (TDERUs). Financing for REDD would be provided through an obligation for developed countries to purchase a certain amount of TDERUs proportional to their overall Assigned Amount Units: a country with high efforts for emission reductions at home would therefore have a lower obligation for REDD contributions. Thus, the REDD credits would be additional to domestic reductions; also, no fungibility with other units would be given, which would prohibit that the carbon market is flooded with forest credits (Thies / Czebiniak 2008). Moreover, unlike in offset-system, a certain amount of REDD credits would be guaranteed for REDD countries. Credits would be made available to purchasers via general auctions, including individual limits on purchases and a collective limit, which would be connected to the overall cap for industrialised countries. The distribution of REDD finance would be organised via a multilateral fund with broadest participation of countries, including equal representation from developing and developed countries as well as other stakeholders.

The **Phased Approach** developed by Angelsen et al. (2009) partly comprises elements of market approaches. It proposes to develop an international REDD architecture in three phases, taking into account that many tropical forest countries are not properly prepared for REDD in terms of, for example, inventories, data availability, monitoring capacities and the like. Therefore, phase one comprises developing national REDD strategies, institution build-up and demonstration activities (readiness phase). These activities would be financed by voluntary contributions immediately available, p.ex. through the pledges made by the Norwegian Government (and others) at Bali and subsequent meetings. Phase two works with a fund-based approach, supporting the implementation of the policies and measures developed in phase one. This phase would include internationally binding commitments by developed countries, ranging from US$ 2-10 billion per year within a four year period, based, for example, on auctioned AAUs. Phase three would then switch to payments of performance basis. These would refer to quantified emissions / removals against agreed reference

levels. Financing would come from selling REDD credits within global compliance markets or a non-market compliance mechanism. Credits could be issued ex post and after having been measured and verified (*baseline and credit*). As an alternative *cap and trade* scenario, credits could also be issued ex ante and the REDD country could then sell credits either to a fund or allocate them to sub-national actors. The country would then need to match emissions from forestry at the end of the respective crediting period with REDD credits (Angelsen et al. 2009).

2.2.3 Positions of the Parties and NGOs

As many of the proposals both by Parties and (Research) NGOs were described above, we present in the following briefly the actors' preference for the respective approach. Parties and groups of Parties in favour of a 'phased' approach are marked with an asterisk (*).

The majority of Parties is in favour of a phased approach which uses different financing options for different stages at different time-scales of a REDD implementation. Several proposals do not specify how to finance REDD saying that both funds and markets could be used to finance emission reductions.

Brazil – as seen above – is in favour of voluntary funding by developed countries as an additional financial resource. Columbia and the CfRN* also support a fund-based approach. Indonesia, India*, COMIFAC* (Commission des Forêts d'Afrique Centrale), Australia* and the USA desire a carbon-market based approach. Australia* suggests to establish market confidence buffers, an international pool of credits in case of an anthropogenic event results in non-permanence. The EU* also supports a market solution and Norway*, Panama and Mexico opt for a market-linked approach. There are others e. g. Canada, New Zealand*, Japan, AOSIS*, Malaysia and China which do not specify their opinion on how to finance REDD.

As for NGOs and other stakeholders, Greenpeace, among others such as CATIE*, EDF*, HSI and TCG, proposes funding by industrialised countries through the purchase of TDERUs (Tropical Deforestation Emission Reduction Units) proportional to the AAUs of each Annex I state in the second commitment period, see above. The difference of the Greenpeace's proposal is that reduction in forest emissions would be additional to domestic reductions and would not work in exchange, cp. above.

2.2.4 Advantages and shortcomings of the different approaches

Looking at the two basic financing approaches, it becomes obvious that both solutions have strengths and weaknesses. In the following, a few of them are highlighted.

The **market approach** is viewed by many scholars as being in the better position to leverage private (and also public) finance through its linking to the markets. Financing does not depend on governments (and taxpayers) and it empowers many players, yielding large volumes of finance. Many also expect that emission reductions can be achieved at lower cost, especially when the market approach is designed as an offset mechanism for developed country commitments (Helme et al. 2007; Ogonowski et al. 2007).

On the other hand, many fear that the inclusion of REDD could generate a huge amount of cheap credits, which could flood the markets and possibly destabilise them (for details, see next section of this paper). A general shortcoming of the market approach is also its inability to trigger systematic / national policy solutions addressing the real drivers of deforestation, such as land-use reforms. The project-/regional level approach also leads to the danger of leakage processes, especially when considering the nature of tropical rain-

forest geography. In addition, the much-needed capacity building and readiness phase will probably be difficult to finance through the market (Thies / Czebiniak 2008). Also, the methodological difficulties related to baseline setting magnify with ever more single activities. If there is a lack of accuracy, the creation of hot air is likely to occur at large scale, threatening the ecological integrity of the whole system (Helme et al. 2007). On a different note, a market mechanism aimed at achieving reductions at minimal costs might not be suited best to achieve co-benefits such as taking care for biodiversity issues and respecting the land rights of indigenous and forest peoples.

Many of the disadvantages of the market approach turn into advantages of **fund-based solutions** when looked at them from the other side. This applies to the stability of the carbon market argument as well as to the idea of systemic solutions addressing the drivers of deforestation, which can be better addressed by a fund delivering payments to national governments (in a national reference level scenario). What is more, funds could (nearly) immediately start operating. Early action will be key in two regards: first, a capacity building phase for creating reliable inventories and monitoring capacities will be needed. Second, deforestation is an ongoing process, which needs to be tackled with high urgency and setting up a market mechanisms will require much more time (Karousakis / Corfee-Morlot 2007).

Shortcomings of the fund-based approaches include the incentive problem, especially when it comes to voluntary funds: if funding relies on non-mandatory pledges by developed countries, a predictable and reliable income stream is hard to guarantee over long periods of time (this does not apply for fund-approaches with income generated by auctioning AAUs, for example). Also, many authors claim that fund-based solutions will not be able to raise as much funding as market approaches (see below for details). Furthermore, setting up funds will require new administrative structures and selection criteria, which could possibly turn out bureaucratic and / or end in political quarrels. An overview with further advantages and shortfalls by Viana (2009) is presented in Table 3.

Effectiveness	Efficiency	Equity	Urgency
Government			
+ strong support of rainforest governments encourages sound policies	+ lower international transaction costs	+ facilitates international transfers between rich and poor countries	- slow implementation of intergovernmental funding
- limited effectiveness of government-based policies	- higher domestic costs	- favours middle-income countries	- slow implementation of government programmes
+ captures domestic leakage	+ greater incentives for governmental policies	risk of domestic inequities	
- does nor capture international leakage	- greater risk of policy and governance failure		
limited attractiveness to private funders	+lower monitoring costs		
Market-based			
- weak support to encourage sound policies by rainforests governments	- higher international transaction costs for small projects	+ increases funding from market to forest communities in poor countries	+ quicker implementation of project-based-activities
+ greater effectiveness of field project-based activities	+ lower bureaucracy and administrative costs	+ does not favour middle income countries	+ quicker impacts in reduction if deforestation and degradation
- does not capture domestic leakage	- smaller incentives for governmental policies	+ smaller risk of inequitable distribution of benefits to local communities	
+ increases area if forests under protection with positive impacts on international forest leakage	+ smaller risk if policy and governance failure	- potential risk of inequitable distribution of benefits to local communities if project certification schemes are ineffective	
+ greater attractiveness to private funders	- greater monitoring costs		

Table 3: Weighing up government and market finance for REDD; Source: adapted from Viana (2009)

Which approach would produce **how much funding**? The *Eliasch Review* on Financing Global Forests, for example, has conducted a detailed financial analysis. Eliasch expects the cost of halving deforestation globally until 2030 to be at about US$ 17-33 billion, see above. The same source contains a model suggesting that including REDD in global carbon markets could deliver US$ 7 billion per year in 2020, depending on the stringency of Annex I targets and the chosen supplementarity limits (Eliasch 2008). This, the study concludes, would leave a funding gap of US$ 11-19 billion per year. This amount would have to be sourced by public funding, e.g. via a fund-based approach.

Dutschke and Wertz-Kanounnikof (2008) analysed how a fund-based approach could be financed. They point out that traditional ODA for forestry has risen from 2000 to 2007 by 47,6%; however, this led to a total sum of about US$ 2 billion for 2005-2007, leaving another gap between the US$ 11-19 billion calculated by

Eliasch.

They also looked at gaining revenues from auctioning AAUs to feed a REDD fund. Some actors, such as the EU, are considering earmarking auctioning revenues from its Emissions Trading System for investments in REDD. A 5% fraction for REDD would yield to US$ 2.0-2.7 billion/a by 2020 (Dutschke / Wertz-Kanounnikoff 2008). The exact amount of other pledges, however, is difficult to assess, as the amount which will effectively be earmarked for REDD is uncertain.

Gaining revenues from other fees, fines or taxes would represent a third option for funding a REDD scheme. Proposals include levying an additional fee on the CDM, either nationally (as China does) or internationally. Exact figures of these possible sources, however, are missing; in any case they depend on the size of the carbon markets post 2012 which is difficult to predict. Levying a fee on international air travel could generate about US$ 10-15 billion, as could, for example, a 0.01 per cent tax on wholesale currency transactions (*Tobin Tax*) (Eliasch 2008; UNFCCC 2007b). Müller and Hepburn (2006) estimate that an average levy of EUR 5 (USD 6.5) per passenger and flight could generate EUR 10 billion annually (quoted from: UNFCCC 2007b).

2.2.5 Integration of REDD credits into the Carbon Market: Assessing Potential and Risks

Including REDD credits in the carbon market can potentially lower the overall cost of reducing emissions worldwide. However, many fear that an integration of fully fungible REDD credits could "flood" the global carbon market with cheap credits and subsequently destabilize the whole system. This section addresses these concerns, mainly through analysing the literature published on this question so far. The comparison of the different research, however, is difficult, as most of them draw on considerably different assumption, p.ex. as regards reduction commitments for future commitment periods.

Livengood and Dixon (2009) looked at the implications for including REDD credits in the international carbon market, based on previous work by, inter alia, Anger and Sathaye (2008) and Thies and Czebiniak (2008). Livengood and Dixon developed a numerical model of the carbon market in 2020. The choice of this date is based on the assumption that before this date it will be difficult achieve a considerable state of market readiness. The model assumes a target of maximum 2°C rise in global mean temperature and analyses different scenarios of commitment levels, ranging from current commitments as announced in 2008, over to 25/30/40% Annex I reduction efforts compared to 1990. It then looks at different REDD credit access options: no access to the carbon markets and a 20 / 50 % supplementarity limit as well as unlimited access to the global carbon markets. Further details and variations of assumption are transparently laid out.

The study concludes that the anticipated supply of REDD credits will lead to a drop in carbon prices in a range of 57 to 59% in case there are no supplementarity restrictions. This, according to the authors, would contribute to making Annex I domestic reduction efforts unattractive, as REDD credits would be cheaper than abatement activities in industrialised countries. The weaker signal of the lower price of carbon would hamper the development of clean technologies worldwide, the authors conclude. The simulations also show that unrestricted integration of REDD credits would significantly lower CDM project activities in the energy and industrial sectors of developing countries. The study thus suggests, taking into account the problems remaining in the areas of leakage, permanence and baselines, to aim for a conservative approach when integrating REDD credits into the carbon market, i.e. limitations/caps on the inclusion.

The **Eliasch** Review, the comprehensive assessment of global financing for forests on behalf of the UK Office for Climate Change (OCC), integrated estimates on REDD costs into the OCC's Global Carbon Finance Model. Eliasch assessed the option for including REDD in the carbon market from 2012-20.

Eliasch found that introducing REDD credits into the carbon market does not necessarily have severe impact on the overall price of carbon. According to Eliasch, price impacts would be minimal, provided a supplementarity limit is used. A 50% or lower level of supplementarity set in the EU ETS in phase III is suggested, which would result in a necessity of continuing more costly EU reduction activities, setting the price for all credits in the market as a whole (Eliasch 2008). This scenario, however, is linked to the overall supplementarity level for international credits into the EU market.

Michaelowa and Dutschke (2009) analysed, inter alia, the period 2013-2020, based on scenario analyses. Unlike other authors, they also took into account corruption rates and other institutional failures in possible REDD countries, which they expect will function as a limiting factor to private sector engagement in countries with high deforestation rates. Further, they include the participation of a possible REDD country in the CDM as a prerequisite, claiming that REDD activities require a comparable amount of capacity. They therefore arrive at a lower number of participating REDD countries and far lower supply levels of REDD credits.

Despite these limitations, Michaelowa and Dutscke expect an oversupply of 7 billion t for 2013-20 supplied by REDD credits, leading to a significant imbalance in the carbon market. This applies even if there are stringent Annex I commitments, unless the multitude of REDD credits triggers deeper emission reductions by industrialised countries. Moreover, Michaelowa and Dutschke point to other risks in a possible REDD market: deliberate distortions of the market. They show that Brazil and Indonesia, responsible for 50% of deforestation in developing countries, would be undeniably able to manipulate the market. They further warn that many scenarios and models may not work as increased global warming may in fact lead to heavy damages of existing forests, which would make REDD options obsolete at least partly. Last but not least, they point to the inability of markets to "find the optimal solution to socioeconomic and biodiversity concerns" (Michaelowa / Dutschke 2009).

For a well functioning market, Michaelowa and Dutschke suggest, inter alia, the following criteria:

- Sufficient demand, ensured by a long-term goal
- Adequate human and technical capacities in REDD countries for assessing and monitoring forest carbon stocks
- Limited supply, achieved by realistic baselines and reliable certification
- Introducing of an upfront funding mechanism for pre-financing REDD activities.

Angelsen et al. (2009) share some of the concerns on potential disruption of market prices. They point to possible safeguards to some of the problems raised above, comprising, inter alia, more ambitious targets for industrialised countries as well as ensuring sufficient demand. The latter would be achieved by obligations for Annex I countries to use a fixed amount of REDD credits for complying with their agreed reduction commitments. Also, allowing private market buyers into the REDD market on top of Parties would contribute to overall market liquidity, according to the authors (Angelsen et al. 2009). On import levels of REDD credits (supplementarity), they also suggest to introduce caps, either internationally or within regional / national trading schemes. A quantification of these proposals, however, is not given. Other solutions include price

floors and ceilings, and the creation of dual markets, cp. section 2.2.2.

2.3 Research Needs

As the above has shown, many issues still need to be explored in detail. On setting **reference levels**, for example, a **standardised methodology** allowing the necessary adjustments according to national circumstances would enable better assessment and ensure comparability. This would also at best make possible reasonable estimates of future emissions (Verchot / Petkova 2009). A lot of uncertainty arises, moreover, due to the limitations in assessing the tropical forest carbon stocks and well as local capacities to build up and maintain inventories.

As for the general policy framework, any REDD mechanism needs to address the proper **drivers of deforestation**, cp. Introduction. A significant part of these factors lie outside the forest sector. Therefore, research should be deepened on the key drivers in different national circumstances in order to better adjust incentive mechanisms so that central parameters promoting deforestation can be diminished. Pilot projects could help to capture information and analyse practical experience. There is also the question on how to integrate local property rights in an overall REDD framework or maybe bundled in different national contexts (Verchot / Petkova 2009).

On financing, considerable experience with multilateral funds provides a good basis for designing a REDD fund, if this option was to be pursued. However, deeper insights into possible **institutional configurations** to create an enabling environment in different country contexts would be helpful. There is also the need of elaboration further on institutional and transaction costs in order to increase efficiency of institutions and ensure equitable distribution of benefits.

On market approaches, it is mainly the **risk assessment** which would need to be further deepened. Even if a number of model-based analyses are at hand, they still work under a number of assumptions, the majority of which are not necessarily applying any more; for example, the stringency of Annex I commitments might vary significantly and the market readiness of REDD countries is difficult to project. Further open questions arise with a view to a possible market integration of REDD credits after 2020. The parameters of a post 2020 carbon market are even more subject to speculation; therefore, research in this field should be strengthened once there is an overall post 2012 climate policy framework.

Boucher (2008) points to further open questions concerning market mechanisms. He demands deeper insights into the varying costs estimates between regions, empirical studies, especially when taking into account that a lot of research works with data gaps due to lack of quantitative data. Further, the amount of time it will take for REDD countries to develop robust political-institutional environments is another unknown factor, according to Boucher. Finally, he ask what impacts would occur in case differing numbers of REDD countries participate in a REDD market and what consequences a 50% vs. a 100% participation respectively would have for the dynamics of the system (Boucher 2008).

3 Conclusion

In this policy paper, we addressed the question how to best finance avoided deforestation in developing countries. Backed by an overview on how this agenda item of the current climate negotations evolved, we first looked at the CDM, which allows for afforestation and reforestation project activities (A/R). However, A/R CDM is not a very successful project type, mainly due to the limited demand going back to the exclusion of forestry credits in the EU-ETS. Other hampering factors include natural as well institutional risks, p.ex. permance issues and the liability question. We then explored basic determinants for a REDD policy framework, such as the scope (REDD, REDD+, REDD++) and options for determining the reference level (national/sub-national). The former will be mainly a policy question to be decided upon by the Parties; however, taking in too many issues at the same time. Therefore, a possible REDD mechanism should start with REDD and then expand to other sectors later, cp. the phased approach proposed below. As for the reference level, a national or an integrated ('nested') approach seems best suited to address all drivers of deforestation and provide for a holistic and comprehensive forest policy. However, as the analysis in this paper shows, there are still uncertainties and knowledge gaps, especially regarding reliable information on as well as effective monitoring and verification systems for tropical forests, which need to be further explored.

On the question how to finance REDD, two basic concepts were juxtaposed and analysed: financing via a multilateral fund vs. market integration of REDD credits. Here, a lot depends on the final decisions on the overall future climate regime for the period after the year 2012. In particular, decisions on the mid-term goal as well as long-time perspective are essential for a reliable financing mechanism. In the following, the derived conclusions and recommendations on the financing aspect.

Taking into account the amount persisting uncertainties and research needs, care should be taken when deciding how to fund REDD activities. Relying on **the market option** only bears **high risks**, starting from the market readiness of many REDD countries, which will not allow a quick integration into the carbon markets, given that uncertainties relating to, for example, forest inventories, baseline setting, monitoring as well as permanence continue to exist. These are increased by (good) governance and corruption issues still burdening many tropical forest nations, which will hamper private sector engagement in these countries to a great extent. This is very well illustrated by the failure of many African countries to participate in the CDM. Moreover, the market-based CDM has so far struggled to fulfil its second aim, i.e. contributing to sustainable development in the host countries (Sterk et al. 2009). What is more, the two financing options in isolation do not seem to be able to generate the necessary funding.

At present, a **combination of fund-based und market approaches** seems to best serve all related interests and requirements. As action is needed now, tackling REDD should be first financed by public funding, both via voluntary donations as well as binding commitments to contribute to a global REDD fund. Once robust inventories have been built and monitoring issues been addressed, an integration of REDD in the carbon market should be pursued. As Karousakis and Corfee Morlot (2007) argue, interest in the creation of markets can also serve as incentive to tackle data insufficiencies or governance issues. Thus, a gradual switch from a fund-based financing to a market integration at a later stage as proposed in the **phased approach** model seems a good solution.

Therefore, in the near future, the focus should be on a **preparatory action phase**, which includes developing national REDD strategies, conducting pilot projects as well as strengthening institutional capacities, accompanied by further work on the data basis. In the absence of an overall UNFCCC post 2012 policy framework, financing at this stage would be at best organised via **voluntary contributions** by governments and channelled through existing facilities, such as UN-REDD or the Global Forest Partnership. These should continue their supportive activities on capacity building, strengthening forest governance as well as financing quick-start measures to initiate early action. At the Oslo Climate Change and Forest Conference, for example, held at the end of May 2010, more than 50 countries signed the REDD+ partnership document. This initiative will support and contribute to the UNFCCC process; developed countries dedicated USD 4 billion as initial public finance over the 2010 to 2012 period.

In the **implementation phase** of the newly developed policy frameworks for REDD countries, funding should be generated based on agreed commitments by developed countries through a **global REDD fund** under the guidance and the authority of the COP. The generation of revenues through auctioning allowances provides good opportunities to generate further funding, additional to voluntary pledges by donor countries. The scale and design of such a measure could again be agreed upon by the Parties to the UNFCCC.

The design of such a fund as well as later possible market integration would need to build on a number of prerequisites, among them, inter alia, good governance, including land tenure and policy incentives, as well as an efficient distribution mechanism, making sure that finance reaches the most appropriate regions, communities, individuals and programmes transparently. In order to prevent in-country leakage, a **national reference level** is most likely to achieve the best results in terms of environmental integrity, possibly with an integration of embedded sub-national activities (cp. nested approach).

These first two phases should ensure **robust data production**, build up of forest inventories and tackling outstanding further knowledges gaps. Over the years, the quality of the inventories would be further improved and pilot projects would show whether and when data are reliable enough to aim at market integration of REDD activities. This approach would be supported by the commitment of Non-Annex I countries in the Copenhagen Accord to develop national inventory reports, to be presented every two years.

A possible inclusion of REDD certificates in the global **carbon market**, perhaps after 2020, could be realised on a step-by-step basis depending on the progress on the crucial issues and determinants. Access to the market could also vary from country to country. In general, market integration will need a strict framework and **guard rails** in order to avoid distortions of the market. This can be achieved either by creating separate markets (cp. the dual markets concept) or requiring that reductions are additional to existing targets, i.e. eliminating the offset-function of REDD credits (cp. the hybrid approach). Other possibilities to limit the number of credits include discounts or caps. Experience with A/R CDM projects shows that a clear framework clearly addressing the issue of permanence is vital; moreover, the additionality issue would need to be solved convincingly in a potential REDD market mechanism as well. An option for safeguarding biodiversity and socio-economic aspects could be attempted through certification schemes and social standards. On the national level, buyers could for example install import restrictions on non-certified credits.

The convincing combination of different approaches on REDD taking into account all determinants and aspects will need time to develop. On the other hand, deforestation continues to take place at continually high levels. Therefore, a well-struck **balance between fast start activity and a thoroughly constructed REDD framework** must be the aim of all future REDD action.

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