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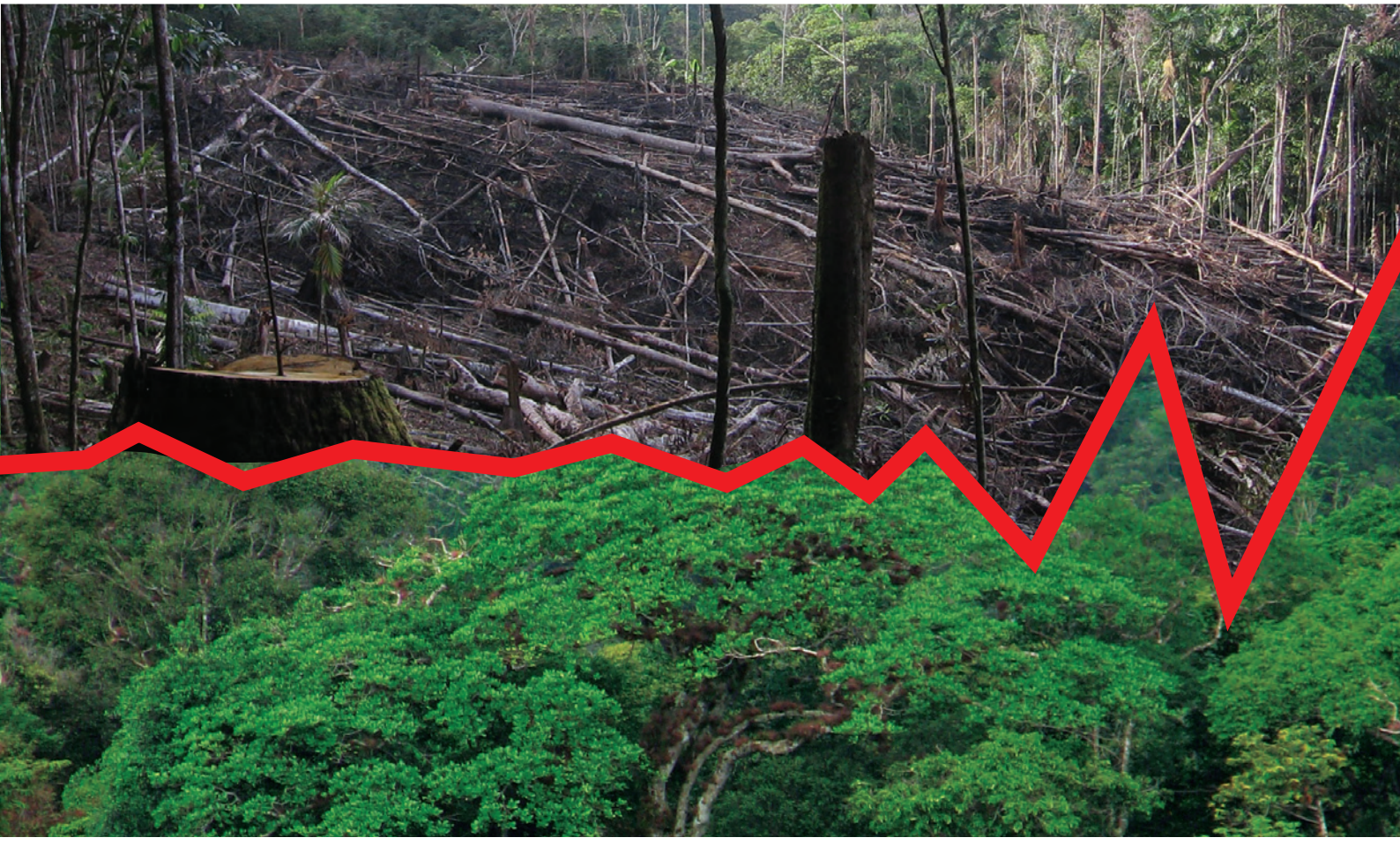
UNEP RISØ CENTRE
CD4CDM

Pathways for Implementing REDD+

Experiences from Carbon Markets and Communities



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SECTION 3. COMMUNITY ENGAGEMENT

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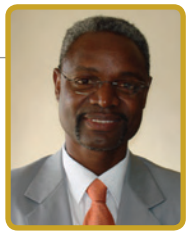

FOREWORD

The financial crisis that has marked the second half of the first decade of the twenty-first century continues to cast its long shadow over the global economy. As capital markets continue to reel and food prices begin to rise once more, it would be easy to focus just on economic solutions. After all, it is not that long ago that President Clinton famously reminded us that 'it's the economy, stupid'. Clearly focusing on the economy is essential, but it is far from sufficient.

As the Millennium Ecosystem Assessment has reminded us, we live in a highly interconnected world, one that is characterized by dynamic complexity, where cause and effect are often distant in time and space, and the delayed and distant consequences are often different from, and less salient than, proximate effects, if they are known at all. In the face of the uncertainty that characterizes complex systems, Nicolis and Prigogine have warned us of the 'dangers of short-term, narrow planning based on the direct extrapolation of past experience'.

This is true, as the TEEB reports are showing, of natural capital, which, while it 'underpins economies, societies and individual well-being', is often overlooked or poorly understood. The multiple benefits of natural capital, the report goes on to remind us, are rarely fully accounted for 'through economic signals in markets, or in day to day decisions by business and citizens, nor indeed reflected adequately in the accounts of society'. At the nexus between the dynamic, adaptive complexity of the interaction between natural capital and human economic systems lies climate change, where cause and effect are indeed distant in time and space. And yet our understanding of causality has advanced far enough to allow us to have some measure of influence over distant effects through proximate causes. Thus, we now know, any solutions to our current predicament have to be found in current interactions of economies and ecologies.

One such opportunity is REDD – reducing emissions of green house gases from deforestation and forest degradation. In its essence it provides for payments to developing countries for reductions in the amounts of carbon dioxide emitted from forests, either by preventing their destruction or degradation, or by enhancing, conserving

or better managing their 'forest carbon stocks', i.e. biomass (latter case then known as 'REDD+'). The intention is increase the economic value of a significantly greater proportion of forests to local people and other stakeholders so that they have a greater interest in keeping them standing, rather than replacing them with other land uses or degrading them because they do not fully understand or cannot realize their proper value.

UNEP has placed REDD+ at the heart of its climate change strategy, not only because 15-17% of all greenhouse gases are emitted as a result of the destruction of forests in developing countries, but also because it potentially catalyses the realization of economic values from the multiple benefits of forests. As a member of the UN-REDD Programme, a collaborative partnership in support of REDD+ bringing together the FAO, UNDP and UNEP, we play a leading role on the transformative potential of REDD+ for livelihoods and economies in forested landscapes. We base this on the realization of economic benefits from reducing carbon emissions as only the first of the multiple benefits of these forests. Forests, clearly, are much more than the carbon they store or can sequester, but we view REDD+ as the opportunity that allows us to catalyse further investments in other ecosystem services from forests, thus adding further 'layers' of revenue streams from standing forests.

This volume of the 'Carbon Market Perspective' brings together first, valuable experiences with REDD+, exploring in particular perspectives on the link between financial markets and payments for performance in delivering carbon benefits from forests and how to enable developing countries to engage in REDD+. It also explores the involvement of local communities and community-based efforts to reorganize the management of forests so that the multiple benefits produced include carbon gains as well as livelihoods. We are at the very beginning of our REDD+ journey, and the world's thirst for information and insights on how to make it work are great. This book will make a significant contribution towards slaking that thirst, a thirst we intend to satisfy completely in the months and years to come, as the UN-REDD Programme continues to deliver on its investments. For, with reference to the TEEB report, two related challenges lie ahead: the first is to understand the multiple values of forests for climate, conservation and human development and integrate them into decision-making. The second is to respond – efficiently and equitably. This volume makes a start on both counts.

Xianli Zhu
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EDITORIAL

The critical role of REDD+ in contributing to the global objective of climate change mitigation is increasingly recognised. REDD+ offers significant potential for rapid and low-cost emission reductions, with the added co-benefits of biodiversity, water and soil conservation, as well as poverty reduction. To date, more than four billion dollars in additional funding have been pledged by developed countries to support REDD+ activities in developing countries, which have in turn announced ambitious targets for emission reductions in the forestry sector. The ongoing international negotiations have included options for establishment of both a market mechanism, and a fund mechanism, or a combination of both to channel funds into REDD+ activities.

Scaling up private investments is essential, as public funding pledges, constrained by budget deficits and the economic crisis, remain insufficient to unlock the potential of REDD+. Experiences of market based mechanisms have shown that private-sector flexibility and initiative are required to complement the role of governments in establishing the proper institutional and financial framework for performance-based REDD+ activities.

The compliance carbon market under the Kyoto Protocol has already helped pave the way for greenhouse gas mitigation through afforestation and reforestation activities. However, the complexity of methodologies for estimating and measuring emission reductions, strict eligibility requirements and high associated transaction costs have resulted in only fourteen projects registered worldwide to date. In contrast, voluntary carbon markets have been much more active, with the development of carbon standards that allow a whole range of REDD+ activities. The total transaction volume of the voluntary carbon market was 387 million US dollars in 2009, of which 31% comes from forestry projects (Ecosystem Marketplace & Bloomberg New Energy Finance 2010).

To achieve significant global greenhouse gas mitigation while ensuring environmental integrity and protecting the rights of local communities and indigenous people, the international community needs to agree upon the rules and principles underpinning a global REDD+ framework. In order to support this process, the current report presents experiences from the compliance and voluntary markets.

This issue of ***Carbon Market Perspectives*** on 'Pathways for implementing REDD+: Experience from carbon markets and communities' discusses the role of carbon markets in scaling up investments for REDD+ in developing countries. Nine articles authored by experienced negotiators on REDD+, carbon market actors, project developers and other leading experts share experiences and make suggestions on the key elements of a future international REDD+ regime: Architecture and underlying principles, measuring, reporting and verification (MRV), private-sector involvement, the rights of indigenous people and local communities, biodiversity conservation and environmental integrity. The articles are grouped under three main topics: the lessons existing REDD+ projects; the future REDD+ regime and the role of carbon markets; and experiences and ideas about the involvement of indigenous people and local communities.

Section 1. Experiences with carbon markets

Starting with pilot projects in the early 1990s, carbon markets have experienced rapid growth in the past few years. The compliance carbon market has proved an effective instrument for stimulating private investment in climate change mitigation and reducing the overall cost of GHG emissions reductions. The carbon market has generated tens of billions of dollars of private investment in GHG mitigation projects in developing countries under the Kyoto Protocol in the past few years. The World Bank publication 'State and Trends of the Carbon Market 2010' estimate that during 2002-2008, the total investment in CDM projects with CER sales contracted was worth 106 billion US dollars. However, private investment in carbon market projects has started to decline due to the stalemate in climate negotiations and the high levels of uncertainty about carbon credit demand after 2012. Further delay in reaching an international agreement could significantly damage investors' confidence and stall the existing momentum of private investment in GHG mitigation projects.

This first section of ***Perspectives*** consists of three articles by authors who have been involved in forestry carbon project development, validation and implementation. The authors share their experiences with forestry carbon projects, ideas on the extent to which carbon markets can support REDD+ implementation, the application of key concepts such as additionality, baseline and leakage under REDD+, and suggestions to overcome methodology and other barriers to rapid and large-scale REDD+ implementation.

In the first article, Dr. Chungfeng Wang, a senior Chinese negotiator on REDD+ issues and a senior expert on forestry project implementation for the regulatory market in China, shares his experiences on forestry CDM and discusses the implications for the design and implementation of a future REDD+ mechanism, as well as China's positions on a REDD+ market mechanism versus a fund mechanism.

The second article is by Sebastian Hetsch and Juan Chang from TÜV SÜD, a Designated Operational Entity (DOE) which has validated and verified the largest number of forestry projects under compliance and voluntary markets. The authors argue that the implementation of REDD+ activities under a carbon market mechanism requires the continued use of key concepts for carbon accounting, such as baseline scenario, project scenario, leakage and additionality. The authors further assess how these

concepts could be applied to various REDD+ projects and discuss their environmental and socio-economic effects.

The third article is authored by four experienced academics and practitioners from Winrock International, a global NGO actively promoting carbon finance as an innovative approach for sustainable forestry and natural resource management. Timothy R.H. Pearson, Sandra Brown, Nancy L. Harris and Sarah M. Walker argue that a key factor behind the limited uptake of REDD+ projects in the voluntary carbon market has been the slow process of methodology development and approval. The authors further suggest an improved approach for transparent, consistent and rapid methodology development and approval for REDD+ project implementation.

Section 2. Future role of the carbon market and the private sector

This section consists of three articles on the main features and components of a possible future effective mechanism for REDD+ implementation. The authors share their ideas on the role of private sector and carbon market implementation, and discuss how to enable and encourage early and wide participation by developing countries with far different levels of readiness regarding REDD+ implementation.

The first article is written by Naomi Swickard from the Voluntary Carbon Standard Association (VCSA) and Kim Carnahan from the International Emissions Trading Association (IETA). Based on their deep understanding about carbon market operations and the interactions of different market players, the two authors note that it is critical to maintain private-sector investment in project activities and supporting mechanisms in order to ensure the adequate financing and effectiveness of REDD+. In order to sustain REDD+ activities in the long term, national and international policies must be designed in ways that maintain private-sector engagement.

The second article discusses the measures to guarantee the proper function of the carbon market in support of REDD+. Dr Charlottte Streck, an experienced climate policy adviser and long-time REDD+ negotiator, believes that linking REDD+ to carbon markets is one way to mobilise additional finance for policies and programs that reduce deforestation. However, the carbon markets carry inherent environmental and social risks, which should be taken into account in the design and supervision of market-based REDD+ financing mechanism. Solutions to manage REDD+ markets involve effective management of the demand and supply of REDD+ credits. Environmental and social benefits need to be guaranteed through safeguards, participatory approaches and transparency that support legitimate and sustainable REDD+ policies.

The third article is about a REDD+ regime framework with the necessary flexibility that could accommodate the REDD+ actions at national, subnational, and project levels, so as to enable early and wide participation in REDD+ implementation. Lucio Pedroni, a leading expert on the nested approach, and two experts on carbon market mechanism and REDD+ negotiation, Manuel Estrada Porrua and Mariano Colini Cenamo, stress that the nested approach leaves countries the option to implement subnational REDD+ programs and project activities, before they are ready and eligible for national-level REDD+ imple-

mentation. Thus, project developers and sub-national program implementers may either participate in a national program and receive credits from national government, or remain outside the national program and receive international credit issuance directly. This flexibility can accommodate the needs of different countries and stimulate fast start implementation by the private sector, national and sub-national governments.

Section 3. Community involvement

REDD+ implementation influences the livelihoods of the large number of people living in and around forestland. Local communities and indigenous people often rely on forest products, both timber and non-timber, as their main or only source of income. Monetary compensations and financial incentives that reach local communities form an essential element of current negotiations on a REDD+ funding mechanism. Section three discusses different aspects of community involvement.

In the first article in this section on Community Involvement, Carol Mwape, a climate negotiator of Zambia, and Dr. Davison Gumbo from Center for International Forest Research (CIFOR), argue that in much of Africa existing governance systems lack clarity on the role of local communities and indigenous people in forest management. In Zambia, the institutional set up for forest management makes it difficult for communities to engage fully in REDD+ activities. The article proposes using the framework of community-based natural resources management to enable local communities to participate in REDD+ initiatives. The authors suggest that local communities zone local forestry areas based on their uses and functions and implement REDD+ activities in the forest areas of compatible uses.

In the next article, Tsegaye Tadesse, a professional forester from Ethiopia, presents his team's early experience in developing a REDD project for the voluntary carbon market. Participatory Forest Management (PFM) has proved to be a viable strategy in Ethiopia's efforts to curb deforestation and forest degradation, which is threatening the livelihoods and food security of its largely rural population. Drawing on project activities in the Bale Mountains Ecoregion, the author discusses how REDD can be pursued through PFM and how forestry carbon can catalyze a shift towards sustainable forest management in Ethiopia.

The third article in this section explores a new role for local communities in carrying out mapping and MRV activities (measuring, reporting and verification). Based on their extensive experiences with implementing REDD+ activities at community level, the four authors of these last article in this publication, Tony Knowles, Michael McCall, Margaret Skutsch and Leon Theron from University of Twente argue that modern technology, particularly small handheld devices, provide opportunities for mapping and storing data. Local communities can easily be trained to carry out the monitoring and reporting, thus lowering the costs of collecting equally accurate forest data.

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UNEP Risø Centre
Energy and Carbon Finance Group

Section 1

Experiences with Carbon Markets

Chunfeng Wang
APFNet

Lessons Learned from Global Forestry Projects in the Carbon Market

Abstract

This paper reviews the lessons learned from the implementation of afforestation and reforestation CDM projects around the world, and discusses the potential challenges of using market mechanisms to stimulate REDD+ actions in developing countries. From a Chinese perspective, this paper suggests how a non-market mechanism may be appropriate for REDD+ actions in developing countries.
The paper concludes that current international negotiations and national governments should consider a range of policies and incentives to integrate both market and non-market mechanisms, so as to maximize forestry mitigation potentials in developing countries.

A. Evolution of forest carbon market

After the American electric utility, Applied Energy Services (AES), launched the earliest forestry carbon project in 1989, dozens of other forest carbon offset projects were implemented around the world before the Kyoto Protocol (KP) came into force in 2005. The early forest carbon projects were mainly initiated by industrial companies as direct investors. These projects were designed by consultants, academics and NGOs employed by private companies, with limited incentives and opportunities for the participation of local people. The price of the credits from the project was very low. Many developing countries also perceived these projects as a way for developed countries to avoid substantive domestic emission reductions and to practice eco-colonialism.

Since 2005, carbon markets, including regulatory and voluntary markets, have grown progressively. The regulatory carbon market, based on the cap and trade regime, includes the KP and non-KP markets. The lion's share of the regulatory market, especially the KP market, is attributed to transactions under the European Union Emissions Trading Scheme (EU ETS), which was formed mainly so the EU could meet its KP commitments. Forestry carbon transactions were the first offsets in the global carbon market, but they were soon sidelined in the expanding regulatory carbon markets. UNFCCC statistics show that, as of August 2010, only 17 out of 2379 registered projects under the Clean Development Mechanism (CDM) were afforestation or reforestation (AR) projects, representing just 0.59% of all CDM projects[1]. No CER credit from AR CDM has been issued to a project to date.

Purchasers of voluntary credits also appreciate the ability of the projects to generate positive benefits for community livelihoods, biodiversity conservation, etc.

Unlike the sluggish forestry carbon projects in the regulatory carbon market, forestry carbon transactions in voluntary carbon markets such as Over the Counter (OTC) have steadily increased in volume. Eligible forestry projects in voluntary carbon market include Afforestation and Reforestation (AR), Reduced Emissions from Deforestation and Forest Degradation (and more broadly, REDD+), Improved Forest Management (IFM) and carbon stocks associated with Harvested Wood Products (HWP). The voluntary carbon credits from forestry projects can be certified against recognized standards. Purchasers of voluntary carbon credits are not only concerned about the carbon credits of forestry projects, they also appreciate the ability of the projects to generate positive benefits for community livelihoods, biodiversity conservation, etc. These factors make voluntary forestry carbon projects highly appealing to large corporations from philanthropy or corporate social responsibility (CSR) perspectives. For example, China Petroleum provided financial support for ten forestry carbon projects in China in 2009. However, the future development of voluntary carbon markets will eventually be influenced by the regulatory carbon market, especially by compliance rules drawn up as part of international climate-change negotiations.

1 http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html

B. Lessons learned from global AR CDM projects

The slow progress of AR CDM projects reflects to a great extent the problems of financing forestry carbon projects through market mechanisms. The lessons learned from AR CDM projects shed light on possible mechanisms for stimulating forestry mitigation actions discussed in current climate-change negotiations. The complexity of the AR CDM rules has prevented the meaningful participation of local people, thus undermining sustainable development. It also significantly increased transaction costs, resulting in little interest on the part of CER buyers and project developers.

1. Lengthy and complex rules

Late start and long verification interval. The AR CDM rules came into force much later than other CDM rules, following lengthy interna-

tional negotiations. The first CDM AR project was not registered until 2006. The Certified Emission Reductions (CERs) will not be issued until 2011 at the earliest because of time required for tree growth and because verification is only conducted every five years for the sake of cost-effectiveness.

Difficulties in land eligibility. Eligible land must have been non-forested for at least fifty years or since 31 December 1989. In addition, considering the lower price of forestry CERs, a minimum scale of some 2000 ha, for example, may be necessary for financial viability. For developing countries, demonstrating eligibility and finding available land of suitable size has often proved difficult.

Demonstration of additionality. Having identified the eligible land, the project developer must demonstrate that the proposed AR CDM project is additional to what would have happened in a business-as-usual scenario. The demonstration of additionality uses the tools developed by the Executive Board (EB) of the CDM. However, the final judgement of additionality is quite subjective since it may be impossible to determine accurately what would have happened to eligible land in the distant future. Some authors argue that it is nearly impossible to verify additionality, as it is subject to intense lobbying and manipulation by profit-seeking market participants (Gorte and Ramseur, 2008).

Complicated baseline and carbon monitoring. To ensure that the carbon credits from the proposed CDM AR project are not only additional, but also measurable, reportable and verifiable, the project developer must apply a reliable baseline methodology and carbon monitoring plan. The baseline methodology and monitoring plan form major elements of the Project Design Document (PDD). The drafting of the PDD requires technical expertise beyond the capacity of local technicians and local people, especially small landowners and the rural poor.

Avoiding possible leakage. Leakage is the increased emissions or reduced sequestration outside an AR CDM project that is caused by the implementation of the project and must be deducted from the total amount of CERs. In the PDD, the project developer must take leakage into account and try to avoid it. The project developer must prove that the proposed AR CDM project does not cause leakage or that the leakage caused is qualified and monitored, and deducted when calculating the project's emission reductions. The need to avoid or quantify leakage further complicates the design of the project.

Non-permanent nature of CERs. The project developer must address the non-permanence issue of CERs from the AR CDM project since trees planted under the project could face various risks caused by fire, disease, logging, forest destruction etc. The issuance of either long-term CERs (lCERs)[2] or temporary CERs (tCERs)[3] addresses the problem of non-permanence. However, lCERs or tCERs have expiration dates and must eventually be replaced by permanent CERs from industrial or energy projects. The non-permanent or temporary nature of the CERs from AR CDM project considerably reduces buyers' interest, dramatically

2 lCER is a CER issued for an afforestation or reforestation project activity under the CDM which expires at the end of the crediting period of the afforestation or reforestation project activity.

3 tCER is a CER issued for an afforestation or reforestation project activity under the CDM which expires at the end of the commitment period following the one during which it was issued.

lowering the price of credits and weakening the competitiveness of AR CDM projects.

Requirements for sustainable development benefits. CDM projects are required not only to generate CERs for KP compliance by developed countries, but also to facilitate sustainable development in developing countries. Thus the social and environmental impacts of CDM projects must be considered during project design. The AR CDM rules require that projects promote biodiversity protection, soil erosion control and improvements to the livelihoods of local people, especially the poor. The PDD must clearly reflect these requirements and may be subjected to social and environmental assessment in the validation and verification phases. Without clear guidance, meeting these requirements may be costly and time-consuming for project developers. Whether existing and proposed CDM projects will contribute to sustainable development will require further assessment, as projects have only now started implementation.

Time-consuming project-registration. The PDD with other relevant supporting documents must be approved by the host country before being sent for validation by the Designated Operational Entity (DOE). The domestic approval and DOE validation usually take several months. Experiences in China indicate that it may take two to three years to prepare an AR CDM project, including drafting PDD, domestic approval and DOE validation, before submission to the EB for registration. Furthermore, there is a great deal of uncertainty with regard to registration time with and the risk of rejection by the EB.

2. Financing failures

The exclusion by the EU-ETS of forestry CERs and the absence of a KP compliance market in America are contributing to insufficient market demand and lower prices. The author estimates that the price of AR CDM credits may be 50% to 80% lower than that of CERs from other sectors.

Upfront costs versus ex-post carbon revenues. At present, it is rare for buyers to provide upfront and tree-planting investments for the AR project. Mediocre internal rates of return (IRR), higher transaction costs and higher risks are unfavourable to project investments. CDM AR projects face difficulties in obtaining up-front funding for project preparation. Thus, developers have to bear investment risks in initiating projects.

Narrow range of IRR. The rules governing AR CDM imply that the project IRR should not be too high or too low. Should the IRR be too high, it would be difficult to demonstrate project additionality, while an IRR that is too low will not attract investors. With increasing global demand for timber in recent years, the competition for forest land has intensified. Under these circumstances, previously marginal forestland with lower IRR has increased in value, which creates completion with CDM AR project financing. Potential investors and local forest landowners may be much more interested in channelling funds into more profitable forest projects than the CDM AR.

3. Lack of clear land tenure

Establishing clear forest land tenure could ensure the delivery of CERs to buyers and benefit the rural poor. As forestry CDM projects have either a twenty-year crediting period renewable twice or a fixed thirty-year crediting period, stable land tenure over decades is necessary to ensure buyers that CERs will be eventually delivered. Clear forest land tenure also ensures the equitable and effective distribution of

carbon revenues, which is also conducive to the participation of local people, especially the rural poor. However, forest land tenure in many developing countries is not clearly defined or enforced.

4. Lack of incentives and clear rules for co-benefits

The pursuit of co-benefits may increase a project's attractiveness to buyers, albeit with increased complexity in project design and implementation and higher transaction costs. To save costs, project developers tend to focus on CERs rather than co-benefits. For example, project developers may introduce exotic fast-growing tree species to achieve higher rates of carbon sequestration, rather than indigenous tree species with slower growth rates but higher bio-diversity value. The introduction of exotic tree species may pose threats for the bio-diversity protection of the whole project area. Secondly, the AR CDM rules require project developers to pursue both the carbon benefits and co-benefits, but there is no detailed technical guidance or guidelines for how to measure co-benefits.

5. Insufficient capacity-building

Capacity-building of local people. Given the complexity of the AR CDM rules, local people and technicians should be trained to understand project concepts, implications and technical requirements, as well as carbon markets. The longer term sustainability of the project depends on the greater involvement of local technicians and local people, which in turn can contribute to reduced transaction costs. It is crucial to improve the capacity of AR CDM project participants in developing countries. To date, insufficient attention has been paid to capacity-building.

Information asymmetry. It is important to improve the bargaining power of local people and safeguard their legitimate entitlement to benefit from the project. Because of their limited knowledge about AR CDM rules and procedures, local people are at a disadvantage compared to project developers and CER buyers and have less bargaining power. Many important project-related decisions, including contracting and pricing, are decided by middlemen or local elites.

Lower CER prices, long-term investment requirements, the temporary nature of tCERs and lCERs, the complexity of rules, higher perceived risks and incomplete markets have all contributed to the discouraging state of AR CDM.

In summary, CDM could theoretically be a win-win option, but in practice AR CDM projects have produced discouraging results. The credits from the AR CDM project were initially limited to take up to 1% of the base year emissions of the Annex-I Parties of KP in the first commitment period (2008-2012), but in practice the 1% cap will not be reached. Lower CER prices, long-term investment requirements, the temporary nature of tCERs and lCERs, the complexity of rules, higher perceived risks and incomplete markets have all contributed to the discouraging state of AR CDM.

C. The implications for REDD+ mechanisms

Under the Bali Action Plan, the parties to the UNFCCC have agreed to promote policy approaches and incentives for reducing emissions from deforestation and forest degradation in developing

countries[4]. REDD+ includes reducing emissions from deforestation, reducing emissions from forest degradation, the conservation of forest carbon stocks, the sustainable management of forests and the enhancement of forest carbon stocks (REDD+). REDD+ actions could be implemented in three phases: (1) the development of national strategies or action plans, policies and measures and capacity-building; (2) the implementation of national policies, measures, strategies or action plans that could involve further capacity-building, technology development and transfer; and (3) results-based demonstration activities.

China considers that, whatever policy approaches and positive incentives may be adopted, equal treatment should be given to reducing emissions from deforestation and forest degradation and to enhancing forest carbon stocks through conservation, the sustainable management of forests and incremental changes of forest cover in developing countries.[5] If the policy approaches and positive incentives are executed effectively, REDD+ actions can be expected to achieve up to 30% cost-effective global mitigation potentials by 2020.

China considers that equal treatment should be given to reducing emissions from deforestation and forest degradation and to enhancing forest carbon stocks in developing countries.

The ongoing negotiations over REDD+ focus on defining the policy approaches and positive incentives for REDD+ actions, namely, who will pay, how the payment will be made and who will share the payment. The most important aspects within the policy approaches and positive incentives that have yet to be determined relate to the question of who will provide financial support. According to the relevant articles in the UNFCCC, it is the obligation of developed countries to bear the financial costs. The debates on how the payments will be made pertain to financial sources, while sharing the payment raises the question of how to distribute financial support to stakeholders in developing countries fairly and effectively. These issues are the most pressing concerns for developing countries.

A financing mechanism could be defined as an institutional arrangement that transfers financial resources between developed countries and developing countries. It must create economic incentives so that developing countries have more interest in protecting forests and the resources to do so. Therefore, the successful implementation of REDD+ actions depends on the effectiveness of the financial mechanism. In the ongoing negotiations, the parties have proposed various options for financing REDD+ actions. These proposals may be divided into market and non-market mechanisms.

Under this mechanism, private sectors in developed countries are permitted to buy REDD+ carbon offset credits enabling compliance with emission reduction commitments. REDD+ credits may be attractive because of their lower price, which would thus provide sustainable financing to developing countries. This could theoretically create a win-win situation for climate change mitigation upwards. China is of the view that a market mechanism is likely to focus more on how to mobilize private financial sources than on financial resource distribution. Such a mechanism may face the following challenges:

4 1.(b)(iii) of Bali Action Plan.

5 http://www.ccchina.gov.cn/en/NewsInfo.asp?NewsId=17509

Are developed countries avoiding domestic emission reduction responsibilities? Developing countries may fear that a market mechanism might become a loophole for developed countries to avoid substantial emission reductions at home. A market mechanism consists of trade of emission rights and entitlements. Since emission entitlements are a valuable resource, developing countries may not wish to sell them. Every ton of forest carbon sequestered through REDD+ actions could allow another ton to be released by developed countries. Using carbon offsets from REDD+ actions for compliance purposes may reduce worldwide investment in clean technologies, allowing developed countries to delay their energy-related emission reductions. In the end, the market mechanism may allow developed countries to continue their business-as-usual development patterns, rather than achieving the goal of GHG emission reductions under the UNFCCC.

Are the emission reduction commitments of developed countries ambitious enough to boost credit demand? Deep cuts by developed countries are the precondition for creating market demand. However, the aggregated pledges announced by developed countries are not ambitious. The delayed climate legislation in America is having negative impacts on international carbon markets. It appears difficult for America to commit to deeper emission reduction targets over the longer term. Another factor unfavourable to a market mechanism is the EU-ETS, the largest emission-trading scheme in the world. The EU-ETS is likely to continue to exclude the use of cheap and non-permanent forest carbon credits in the foreseeable future.

Are the credits from REDD+ actions always less costly? The low cost of REDD+ credits may be a false assumption. Experiences with the first registered AR CDM projects in China indicate that the cost of generating forests credits may be higher. Costs depend on driving forces and opportunity costs, which vary by country or region, or even according to soil and climate conditions, land use, project size, market location, existing infrastructure etc. Because of large-scale afforestation and reforestation in past decades, the remaining eligible land is mainly concentrated in dry and semiarid areas in central and western China. To implement a REDD+ project in western China would require higher investments, even if the opportunity costs of REDD+ activities in these regions prove to be lower. The costs of carbon credits from forestry activities range from US $10 to $150/tC, or roughly US $3-40/$tCO_2$. Therefore, the credits from REDD+ activities are not always less costly.

Can market mechanisms generate lasting financial flows to scale up REDD+ actions? Sustainable financial flows can only be expected from a stable carbon market, which is dependent on the stable demand and supply of carbon credits. Carbon markets are to some extent influenced by consumer choices, macro-economic factors and weather conditions, such as wind and rainfall. The World Bank's State and Trends of the Carbon Market 2010 underlines the fact that the recent global economic crisis also affected the demand and price of carbon, as well as the availability of investment capital. The same pattern holds true for the EU-ETS. The economic slowdown has lead to emission reductions from European large-scale industries in the last two years. In many cases, actual annual emissions declined below the regulatory caps, which effectively reduced heavy industry's demand for additional EU emission Allowances and Emission Reduction Units in 2009. The year 2009 also marked a major decline in new carbon project development. The Carbon Markets & Investors Associa-

tion estimated that new investments in carbon offset projects in developing countries fell by 30-40% in 2009 and would continue to drop in 2010. When REDD+ activities are implemented on a large scale, land-use competition may intensify, increasing opportunity costs accordingly. The increase in the cost of REDD+ credits, associated with the complexity of REDD+ rules, and issues of non-permanence are a disincentive for carbon buyers and investors. Relying on a market mechanism to maintain sustainable financial flows to scale up REDD+ activities may thus be unrealistic.

Can a market mechanism be applied to compensate for the stabilization of baseline carbon stocks and while ensuring capacity-building? Forest conservation under REDD+ is intended to maintain forest carbon in existing forest, or baseline carbon stocks. Since forest conservation action does not cause changes in forest carbon stock, it is hard to apply a market mechanism to stimulate forest conservation actions. Another concern is the need for capacity-building, which is crucial for the successful implementation of REDD+ actions. Under a market mechanism, buyers are less concerned with capacity-building.

Can market mechanisms be favourable to small landowners and the poor? Small landowners and the poor lack the necessary technical and marketing skills to engage in carbon markets. Buyers may prefer to contact local elites, who work as brokers or intermediaries. In these situations, local elites control carbon revenues and benefit more from the AR CDM project than small landowners. A market mechanism is therefore not favourable to small landowners and the poor.

Can a market mechanism improve local governance? Good forest governance[6] is a precondition for the effective and efficient implementation of REDD+ actions. Market mechanisms may be effective in mobilizing finance within certain periods or at financial scales, but it is difficult for a market mechanism to change the socio-political context of REDD+ in developing countries. The effectiveness of a market mechanism depends on existing favourable socio-political governance structures. Forests are not just standing carbon stocks waiting for economists to value them correctly so that they are not cut down: they are homes to hundreds of millions of people. Defending the rights of indigenous people and local communities is crucial to preserving forests, which requires the elimination of uncertain forest tenure, corruption and inadequate policing, the empowerment of indigenous people and local communities, and the establishment of an equal and fair benefit-sharing mechanism. A market mechanism cannot ensure the satisfaction of these requirements in improving local governance.

Are the complex technical rules hampering REDD+ actions? Under a market mechanism, especially in compliance markets, clear technical rules guiding REDD+ actions must be established. No matter whether REDD+ actions are carried out at national or sub-national level, it is necessary to address issues of additionality, reference level, MRV requirements and leakage. The complexity of technical rules may be inevitable and may pose an even bigger challenge for developing countries.

6 Good forest governance could cover following aspects: being accountable at all levels; transparency and legitimacy towards one's constituencies; equity and equitable sharing of forest revenues and costs; respect for all stakeholders and promotion of the public interest; justice, sanctions and fighting corruption; information, education and communication; decentralization of forest management and decision-making; respect for the rights and traditions of local and indigenous people; law enforcement and other rules and regulations; and improving forest monitoring and control systems (source: Bodegom and Klaver 2007).

2. Non-market mechanisms. Under this mechanism, an international multilateral public fund under the UNFCCC may be created for results-based compensation of REDD+ actions. China believes that funding for REDD+ activities should be new, that is, additional to the Official Development Aid (ODA) of developed countries to developing countries as defined in the UN Millennium Development Goals (MDGs). Such funding should consist of contributions by developed countries. Developed countries may raise these funds through various means, including increased fiscality, public and private donations, taxes on carbon-intensive goods and services, auctions of national emissions trading allowances, reduced subsidies to fossil fuels and penalties or fines for non-compliance. The operational model for a non-market mechanism or fund mechanism could be articulated as follows:

Applying for funding. A developing country government could voluntarily send a proposal to the executive board or entity managing the international multilateral public fund to express its willingness to undertake REDD+ actions. The proposal should follow the specific requirements regarding the format and contents agreed by COP and outline the steps to the actions at the national level, including the creation of a national REDD+ action plan and strategy, a national reference level and a rough projection of reduced emissions or enhanced removal through implementing the proposed REDD+ actions.

Action approval. A technical panel under the executive board or managing entity of the international multilateral public fund would assess the feasibility of the proposed REDD+ actions submitted by a developing country based on standards or criteria to be established under the COP. The panel would present its recommendations to the executive board or entity of the international multilateral public fund for final approval.

Upfront funding provision. Upon approval of the proposed actions, the developing-country government should be provided with some upfront funding for its initial activities under the proposal, such as capacity-building, establishing a forest carbon monitoring system, attracting private investment to potential projects etc.

The non-market mechanism or fund approach is based on the concept of compensation transfer. China believes that funding for REDD+ activities should be additional to Official Development Aid (ODA).

Performance-based payment. After a certain period of time in the implementation phase, for example, five years, the developing country would claim finance from the fund for the reduced emissions or enhanced removal actually achieved. An international technical team approved by the executive board or entity of the international multilateral public fund would make an evaluation of the reduced emissions or enhanced removal actually achieved in the country by comparing the actual situation with the national reference level previously established. The difference would then be used as the basis for the compensation transfer from the international multilateral public fund to a national fund in the developing country.

Domestic distribution of funding. The national government could distribute the received international compensation to the local people, small landowners or the poor in line with the policy

guidance to be created for carbon revenue distribution. The policy guidance could be established through the broad participation of local people, small landowners and the poor.

The main disadvantage of the non-market mechanism resides in the fact that the financial sources of the fund may be relatively limited from a long-term perspective. The advantage of a non-market mechanism is that it could avoid most of the controversial issues inherent in a market mechanism: the non-market mechanism generates credits for compliance purposes in developed countries and has less complex technical requirements. Many transaction costs that would occur under the market mechanism could be avoided. The operational costs under the non-market mechanism may even be slightly lower. Government agencies in developing countries could play a central role in implementing REDD+ actions. A non-market mechanism could encourage governments to establish a series of new policies to address forest-land governance issues. It may also encourage private-sector investment by providing incentives such as grants, tax relief and subsidized loans, as well as supportive political and institutional environments.

D. Conclusions

REDD+ actions are broadly perceived as cost-effective and competitive mitigation options for developing countries to exploit in the next twenty to thirty years. To maximize the mitigation potential, REDD+ actions should not be limited to deforestation: all the actions within the scope of the current REDD+ should be equally treated.

To stimulate REDD+ actions, a financial mechanism must be established as quickly as possible. This mechanism should address financial resource mobilization and allocation or disbursement. The successful implementation of REDD+ actions would rely on the financing scale and its fair, effective and efficient distribution. Governance issues such as clear and safe forest tenure or carbon revenue distribution policies should be seriously addressed before the establishment of any finance mechanism.

The current proposals for financial mechanisms cover both market and non-market mechanisms. The market mechanism may provide relatively sustainable financial flows for the REDD+ actions, but faces controversies regarding to the equal sharing of global emission entitlements between developed and developing countries. The generation of credits for compliance purpose faces many complex technical barriers for local people in developing countries. Credit demand in a market mechanism is dependent on deep emission reduction commitments by developed countries. Current emission reduction pledges would not be able to create sufficient demand for the credits from REDD+ actions. The non-market mechanism or fund approach is based on the concept of compensation transfer. Although the mechanism could avoid most of the disadvantages inherent in the market mechanism, it would face the challenge of stimulating sufficient and sustainable financial flows. Both approaches require matching policies from developing-country governments, which are crucial to ensure fair and effective distribution of their funds.

In conclusion, due to the complexity of forestry issues and various forestry situations in developing countries, no single magic solution can be sufficient for the effective protection of global forests. To maximize forestry mitigation potentials, current international negotiations and national gov-

ernments should adopt a portfolio of policies and incentives, including the integration of market and non-market mechanisms, to stimulate practical actions in developing countries.

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Key Concepts for Carbon Accounting of REDD+ Projects

Abstract

REDD+ is seen as a tool with which to channel finance into the conservation of forests and its carbon stocks. While several REDD+ projects have been designed and implemented on a voluntary basis, no agreement has been reached as yet on the international level. This paper outlines the key concepts for implementing REDD projects and enabling carbon accounting, which is seen as a prerequisite for mobilizing finances in the carbon market. The main concepts are related to setting the baseline scenario and defining and quantifying project activities, leakage and project emissions, while taking biodiversity and socio-economic impacts into account.

1. A bit of history: forestry in climate negotiations

1.1 The characteristics of forestry-related GHG emissions

Forestry and land-use projects have had a rocky ride in coursing through climate change negotiations. Although emissions from land-use change contribute to roughly one fifth of the world's human-induced greenhouse gas (GHG) emissions, their impact on carbon markets and carbon finance has been negligible. The main reasons for this are tied to the complexity of such projects: while it is fairly straightforward to quantify the amount of GHGs emitted from a manure pit or an industrial plant, sequestration and storage of carbon by ecosystems

such as forests pose particular problems, for two main reasons:

1) The temporal aspect: carbon stored in forest ecosystems is not necessarily fixed permanently. Ecosystem disturbances, such as fires, storms or insect plagues, may lead to the release of previously sequestered carbon. When it comes to carbon sink projects, i.e. those designed to protect a threatened rainforest, such a disturbance (including human intervention such as tree harvesting) needs to be accounted for. Hence, GHG emission removals can be released again.

Forestry and land-use projects have had a rocky ride in coursing through climate change negotiations.

2) The spatial aspect of forestry projects: unlike most other climate-change projects, land-use and forestry projects cover large areas. Thus, other aspects of land use beyond carbon storage are also potentially affected by a carbon project, in particular:

   a. The impacts of a project on the ecosystem and its biodiversity. Low-carbon ecosystems do not imply low levels of biodiversity and vice versa. In particular, when it comes to fast-growing plantations, the spatial aspects with regard to biodiversity have to be assessed with care.
   b. The livelihoods of people living in the vicinity of the project or in the project area, given that most areas are under some kind of use, whether legally or without a clear legal position.

These issues have lead to much discussion on whether and how to include forestry and land-use projects in climate-change negotiations and ultimately in the carbon market in order to provide direct access to carbon finance for the protection and expansion of forests.

1.2 Experiences with forestry CDM project implementation under the Kyoto Protocol

As part of follow-up negotiations to the Kyoto Protocol it was decided that, under the Clean Development Mechanism (CDM) of UNFCCC, only afforestation and reforestation projects would be allowed under special rules:

1) Temporary credits: the credits generated from CDM forestry (AR) projects are of a temporary nature. Unlike regular CDM (or JI) projects, the credits expire after the end of the subsequent commitment period[1] (in case of tCERs), which is expected to be roughly five years, or at the end of the project's crediting period (in case on lCERs), which is usually twenty or thirty years. Afterwards the credits have to be replaced. Therefore the real value of the credits is significantly lower than a permanent Certified Emission Reduction (CER), as all it can do is to defer the emission reduction obligation to a future point in time[2].

   Further it leads to a commodity that is not easily interchangeable and tradable with regular CERs, as their needs to be certain

1 The commitment period is a reference to the Kyoto Protocol (five-year commitment period). The concept assumes that a successor to the Kyoto Protocol will also have defined commitment periods of, e.g., five years.

2 Wallner, Klaus (2010): Klimaschutz durch Forstprojekte: eine ökonomische Bewertung temporärer Zertifikate im Rahmen des Kyoto-Protokolls. PhD thesis, Technical University Munich, Germany.

liquidity for a defined CER type or product to actually have a functioning market.

2) Complexity of methodologies: due to lengthy upfront discussions on whether and how to include forestry projects, forestry methodologies prove to be significantly more complex than regular CDM methodologies, and it takes significantly more time for the first methodologies to be approved. For example, the first regular CDM methodology (AM0001) was approved in September 2003 and consisted of 10 pages with 8 monitoring parameters, while the first AR methodology (AR-AM0001) was approved in December 2005 and consisted of 54 pages with over 60 monitoring parameters. Subsequent AR methodologies published in 2006 (AR-AM0002 - AR-AM0005) were compendiums of around 100 pages with around 100 monitoring parameters. Writing a Project Design Document in the forestry field takes a long time and involves substantial costs. The first AR-CDM project was registered in November 2006, the second and subsequent AR-CDM projects in 2009. Recently, consolidated AR-methodologies were approved that significantly simplified the documentation of AR-CDM projects.

1.3 REDD: the rise of forestry in climate negotiations beyond 2012

At the climate conference in Montreal in 2005, forestry and reduced emissions from deforestation and forest degradation (REDD) were again put on the political agenda for discussion at the international level. Countries started realizing that an effective agreement to combat climate change should not neglect the share of emissions resulting from land-use changes. The process was further aided by the fact that the topic of REDD had been brought forward by two developing countries, Costa Rica and Papua New Guinea. As a result, REDD is now one of the more advanced sectors in international climate-change negotiations, and although uncertainties remain, agreement is much closer than in other sectors. A key development in the course of the revived negotiations on REDD has been the fact that more attention is being given to the general conservation of forests and carbon stocks, that is, through sustainable forest management and other forest related measures. It is for this reason that the '+' has appeared after the REDD acronym ever since the climate change negotiations in Poland in 2008.

As discussions on establishments of systems for carbon finance for REDD activities are ongoing, it might be worthwhile to take a look at some of the key issues to determine whether experience from existing forestry projects can provide useful insights into designing or updating a system for forestry and land-use projects such as REDD.

Much discussion has focused in the past regarding the level at which REDD activities should be set up, national, sub-national, or a mixture of both, the so-called 'nested approach'. The key concepts presented in this paper are mostly applicable to both national and sub-national approaches.

2. Carbon market for REDD activities: key concepts and their applications

2.1 What is needed to mobilize finances for REDD activities?

The simple answer is supply and demand. Demand for carbon credits from REDD would need to be generated by a (compliance) scheme

that fully considered this type of action. This is the first and most crucial requirement. Supply through implementation of concrete REDD action and/or projects could come from developers or public entities (i.e. a country government) offering such carbon credits.

Carbon credits from REDD activities could be made available in accordance with the Eliasch Review[3]. The most crucial and as yet still unfulfilled requirement is the existence of a demand-driven market. As long as the international community, on post-Kyoto or other bilateral or multilateral levels, does not come up with a framework that considers REDD, there will be no market-based financial flows into this field.

The climate bills proposed in the US had initially foreseen a stronger role of carbon credits from forestry based projects. However, the latest drafts do not include this option any more. Thus, it is clear that carbon finance for REDD is still largely dependent on decisions taken in the international climate-change arena for the consideration of this project type.

Another concept for channeling carbon finances into REDD activities is to channel resources through a fund which then finances REDD forestry activities. Several bilateral funds for REDD activities have already been set up (e.g. by Australia, Norway, USA), as well as multilateral funds (e.g. GEF, World Bank).

All approaches share the idea that a quantifiable/ measurable output in carbon is desirable and even necessary. In particular a market-based approach requires the generation of a commodity that fulfills certain standards and is based upon agreed norms and criteria. A fund-based mechanism could also be designed in a way that it is output-driven (benefits would depend on the amount of carbon sequestered), which would, however, lead away from the idea of carbon finance and in the direction of regular development aid.

2.2 Third-party assessment

The major task in mobilizing finances is an adequate determination of the emissions reductions and carbon credits, while fulfilling certain criteria in relation to biodiversity and socio-economic impacts. However, the commodity that is generated is not tangible. Therefore key aspects in generating such a commodity are transparency and compliance with certain standards to ensure that the commodity is being generated according to equivalent criteria. This is usually done through an independent assessment by a third party.

A common concept regarding the quantification of emissions reductions and generation of carbon credits is to take a two-step approach, both assessed through third-party certification. In a first step before project implementation (ex-ante), the expected emission reductions are estimated, and the concept of the project is 'validated' against the criteria of the chosen standard. The actual carbon credits are only issued in a second step, once the materialized emission reductions (or removals) have been 'verified'.

2.3 Quantification of output in REDD projects

The maths behind the quantification is fairly simple in theory, involving a comparison of the

3 The Eliasch Review models a potential supply of carbon credits from REDD activities of 3.5 $GtCO_2$ per year in 2030.

emissions of the 'baseline scenario' with those of the 'project scenario'. What it comes down to is a determination of the following:

1) Emissions in the baseline scenario: in the case of REDD, the emissions are mainly based on area deforested and degraded, and how the emissions are generated (through burning, timber harvest, decay, etc.). Usually this is quantified based on historical deforestation data, i.e. for a defined region (if used for a project) or on the national reference level.

2) Emissions in the project scenario: in the case of REDD projects, these are emissions that are still occurring in the project area, in spite of the project.
Also emissions that occur additionally due to project activities need to be considered (e.g. when a project activity is intensifying agriculture through the use of fertilizer, then additional GHG gases are emitted because of the fertilizer)

3) Emissions through leakage: these are emissions that occur in other places due to the displacement of activities. For example, when a REDD project protects the project area from the cutting of timber, the activity might be shifted to a neighboring area in the vicinity, increasing emissions in this area; hence this effect has to be taken into account.

All these points appear straightforward, but complexity evolves in practice. The guidelines for the quantification of GHG emission reductions / removals are usually detailed in 'methodologies'. Several methodologies exist for afforestation projects. As the CDM does not permit REDD to be taken into account, no REDD methodologies have been developed under the UN scheme. The first REDD methodologies have been established under other standards (e.g. VCS approved the first methodology in August 2010).

The key elements for quantification of carbon in forestry projects, and in particular in REDD projects are discussed in the following:

Additionality and Baseline Scenario

The term 'additionality' asks whether a project activity is being conducted because of the incentive of carbon finance, or whether it would be conducted anyway in the absence of such finance. In the latter case the project activity is considered to be the baseline scenario, hence the project is not additional. Carbon finance would not have an impact on GHG emission reductions – quite the contrary, generating carbon credits from non-additional projects could encourage emissions to occur elsewhere (and be supposedly carbon-neutral even though no additional offset effects are taking place).

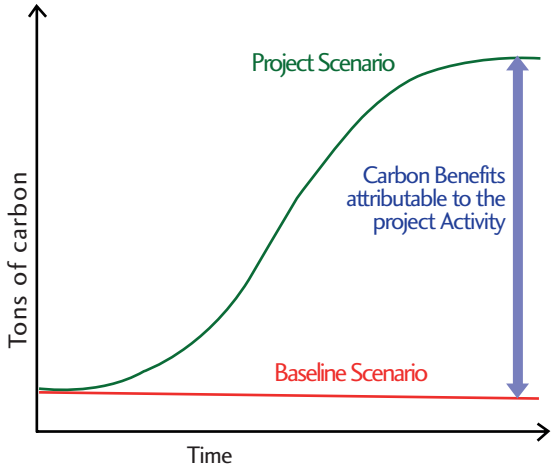
The challenge is to a find a baseline model that is as complex as necessary but as simple as possible.

The baseline scenario is what would happen to the project area without the proposed project activity. If the project activity is not 'additional', then the baseline scenario and the project scenario are similar. In many land-use situations, carbon uptake is very likely to occur without any activity taking place. In the tropics and subtropics, once an area is taken out of production, spontaneous re-growth of forest vegetation is likely to occur. Even in

countries with a high level of deforestation, many forested areas may be out of the reach of loggers, in which case the baseline would be equal to the project scenario[4].

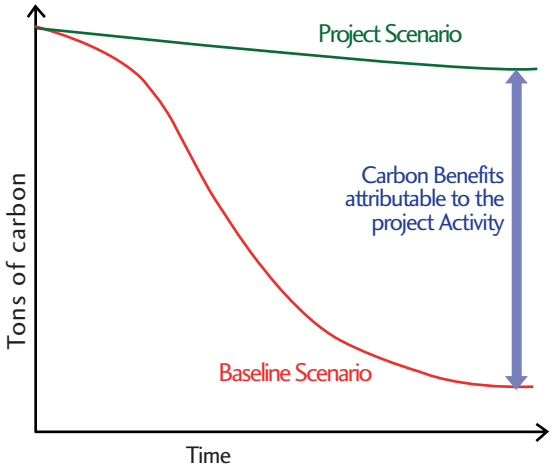
In AR projects, the baseline scenario is of less importance, as usually it assumes carbon stock changes close to zero (or even declining). Therefore all carbon sequestered by growing trees can be assumed to be carbon benefits attributable to the project (Figure 1). As the project scenario corresponds to the actual situation on the ground, it can be (fairly) easily measured and the amount of carbon credits generated determined.

Figure 1. *Carbon benefits (GHG removals) attributable to an AR project (baseline vs. project scenario)*



In the case of REDD, the baseline scenario assumes a high carbon stock in the beginning and a continuous decline, while the project scenario assumes a steady state or slow decline in carbon stock in the project area (Figure 2). The decline of the project scenario depends on the actual success of the implementation of the project activities in the REDD project. As, however, the baseline scenario is only hypothetical, it cannot be measured directly. Hence also the carbon credits generated cannot be measured directly, but depend mainly on how the baseline scenario is set up.

Figure 2.*Carbon benefits (GHG emission reductions) attributable to a REDD project (baseline vs. project scenario)*



Different approaches for the determination of baseline scenarios are possible. A simple approach would be to extrapolate historical deforestation rates into the future. This approach would be difficult to apply to a project (sub-national) level, and it might neglect the complexity and influence of different drivers of deforestation. Furthermore, a simple extrapolation is based on the premise that past behavior is representative of future behaviour, which conflicts with forest development theories stating that forest cover recovers once a certain level of economic development is reached in a country[5].

More complex approaches for baseline scenarios are all based on some type of modeling. The challenge is to a find a solution that is as complex as

4 Dutschke, Michael (2010). Forestry, Risk and Climate Policy.

5 Costenbader, John (ed.) 2009. Legal Frameworks for REDD: Design and Implementation at the National Level. IUCN, Gland, Switzerland. xiv + 200 pp.

necessary but as simple as possible. The generation of carbon credits must be transparent and traceable, for third-party verification as well as for transparency in the market. The more complex the models are, the better they might fit one particular situation, but they may become a black-box and difficult to understand for people other than the modeler himself. This makes any independent assessment time-consuming and cost-intensive.

As transparency is one of the core criteria for generating carbon credits, this is a major hurdle for any REDD project. The method of calculation for REDD baseline scenarios is likely to be influenced by political considerations more than technical issues. Host countries will be tempted to exaggerate baseline trends and thus set low targets in order to maximize the potential output of carbon credits.

Once the baseline has been defined and set for a REDD project, it needs to be readjusted at certain intervals (e.g. every five or ten years) to ensure that the assumptions are still valid. This means that the baseline has to be re-assessed after some time based on new information gathered during the period. However, this might also be a challenge for many developing countries in which the relevant information required for re-assessing the baseline is not updated frequently or is not systematically archived.

Project scenario

The project scenario represents the actual situation on the ground. Compared to the baseline scenario it can be measured relatively easily, as it is 'just' a forestry inventory representing the determination of carbon stock. Of course, in practice this can also be difficult to implement on the ground. The project areas are often in areas that are difficult to access, and knowledge is needed regarding the ecosystem, plants and soils. In particular, in tropical countries where most REDD projects are expected to occur, reliable data for measuring and monitoring carbon stocks and changes in them is not always available. However, here existing AR projects and forestry research can provide some lessons on ex-ante calculations and ex-post monitoring.

In the main a combination of remote sensing image analysis with ground-based sampling can be used to determine carbon stocks. Increasing numbers of studies help quantify the carbon sequestered in trees. Although there still is plenty of room for improvements to data, a foundation has been set.

Project emissions are related to activities of the project that are designed to reduce GHG emissions. This can range from fossil-fuel emissions for driving vehicles for fire control to the use of fertilizer for increasing productivity on agricultural area to prevent forests being cut for farming. The basic approach for quantifying carbon emissions has already been elaborated in existing climate-change projects (both AR and regular CDM projects, for example). Therefore several methodologies and tools are available to assist respective emission calculations.

Leakage

Leakage is the displacement of activities from the project area to other areas due to the implementation of the project activity. Practically all REDD projects involve pre-project activities, otherwise the area would not be exposed to deforestation or degradation. Similarly, most AR projects involve pre-project activities in the project area, otherwise natural succession would recover the area sooner or later. Hence, the concept of leak-

age is similar in AR and REDD activities: most areas are being utilized by people, either legally or without a clear legal status for land use.
The challenge is to determine and quantify the utilization, in particular when it comes to activities without a clear legal status and/or seasonal activities. The only possible approach to quantifying these activities is through communication with the stakeholders concerned. In the case of illegal or seasonal activities, such inquiries can pose difficulties in obtaining accurate data.

The only possible approach to quantify utilization by local people is communication with the stakeholders concerned.

The basic information needed to determine the amount of leakage and its impact is as follows:

1) What kinds and extent of activities were being carried out in the project area before the project was implemented?

2) Where can these activities be carried out in future, or can alternatives be devised by the relevant stakeholders?

In particular, answering the second question can have far-reaching impacts, as it might imply a change in livelihood for the stakeholder. If the stakeholders are just displacing their activities to a different, adjacent area, there would be no net benefit. Therefore providing an alternative livelihood to people who had been involved in deforestation / forest degradation, or a different activity / income to entities involved in deforestation is at the core of a REDD project.

A difference in leakage between AR and REDD projects relates to matters of scale. While AR projects range typically between 100 and 10,000 ha, REDD activities usually have a scale of several 10,000s of hectares. On a practical level this makes the determination of leakage more difficult in REDD projects. Furthermore, the potential impacts of extensive REDD projects for local communities can be more significant if a large, continuous area is set up for REDD, compared to multiple small-scale plantations set up for AR.

Leakage is of particular importance at the sub-national (project) level. At the national level, leakage is considered to be less of an issue, as it could only occur internationally, which would then potentially change the balance in another country.

Permanence

The discussion of permanence has surely been one of the key hurdles for forestry and land-use projects to join the regular carbon market. The difficulty is obvious: trees sequester carbon when they grow, but they can emit it even faster when they burn or decay. Hence, carbon sequestered in trees, forests or other ecosystems is not necessarily permanently fixed.

For AR projects under CDM, countries have decided to solve this issue by issuing 'temporary credits', which lose their validity after a certain time. Other (voluntary) carbon standards have decided rather to estimate the risk of the carbon sequestered being released again. The risk is calculated in tons of carbon and deducted from the actual amount of carbon sequestered when issuing carbon credits. This 'risk buffer' can generate a reserve to compensate for future losses in carbon stock.

The main benefit of a risk buffer approach is that permanent, fully eligible and tradable carbon credits can be generated. Carbon credits from forests can thus become part of a regular carbon market. No extra market for 'land-use carbon credits' is generated, since this might not have the necessary size to be fully functional as a market.

The question of how to assure permanence for REDD is similar to the case of AR projects. Under voluntary standards like VCS, the risk buffer approach will be applied.

Under the UN compliance scheme no decision has been made as yet. If it is included in the CDM, the concept of temporary credits is likely to be adopted as in AR projects.

2.4 Biodiversity and socio-economic impacts

Biodiversity

The impacts of AR and REDD projects on ecosystems and biodiversity have similar assessments. Both project types have an impact on the project area over its spatial extent and thus influence the ecosystem. While some AR projects have been criticized by environmental NGOs for using exotic, fast-growing species, REDD projects have faced less criticism for their impact on ecosystems. This is mainly because they focus mainly on the conservation of the native forest ecosystem and thus have a positive effect on ecosystems per se.

Some voluntary standards like CCBA focus in particular on the biodiversity benefits of land-use projects. Additional monitoring is required under this standard for land-use projects.

Socioeconomic impacts

The socioeconomic impact of land-use projects is one of the most sensitive issues. Experience with AR projects has been positive, as in most projects local communities are involved, and in forest plantations in particular, employment is generated for local people. In cases where local farmers actually own the plantations, additional income is generated in the project area.

However, REDD projects are more complex, mainly due to the greater possibilities of implementation. Protecting forest from all harvesting typically results in maintained or increased forest carbon stocks, but it also reduces the wood and land supply to meet other social needs. As such it is not necessarily of benefit to local communities if 'their' forest is included in a REDD project. This depends on:

1) Who are the drivers of deforestation or forest degradation? and,

2) What kinds of activities are being implemented to stop or decrease deforestation/ forest degradation?

In simple words, if 1) the driver is a logging company from outside the project region, not offering jobs to local people, and 2) the project activities involve local people, perhaps even offering employment, then the impact is likely to be positive. However, the opposite scenario can also be drawn. Hence, the key is the proper involvement and good understanding of local communities, stakeholders and their livelihoods when designing a REDD project. Their involvement is crucial, given that such projects focus on stopping ongoing or planned activities and providing different alternatives.

3. The way forward

In past decades significant amounts of development aid have been channeled to protecting forest cover, especially in tropical countries. Nevertheless, forest cover has been constantly decreasing in most tropical countries. Therefore one might wonder why carbon finance should now turn the tide and halt deforestation. After all, carbon finance is just a tool for channeling financial resources to (forest-rich) developing countries (and the actual amounts of resources available are not yet certain).

However, two new aspects link carbon finance to the halting of deforestation which had not been present before:

1) The linkage between climate change and REDD has been established and discussed at a high political level and attracts greater attention to deforestation than in the past. This can help in creating a momentum for implementing policies and practices for the protection of forests and sustainable forest and land-use management at the national and sub-national levels.

2) Significant amounts of financial resources have been promised, and they might be granted on the basis of results. If countries only receive benefits when presenting the successful implementation of REDD projects, more focus might be placed on the results, which implies a proper quantification of carbon benefits. However, only with successful implementation of REDD activities and honest and transparent carbon accounting will carbon finance be available in the medium and long term.

The crux for the successful implementation of REDD projects will be to design projects that offer stakeholders involved in deforestation or forest degradation an alternative for incomes and / or livelihoods, whether small-scale farmers utilizing the forests with unsustainable slash-and-burn agriculture, or large companies cutting the forests for pulp wood or pasture land. In any case, alternative modes of sustainable employment have to be found together with these stakeholders. Carbon finance can only contribute to the solution: the overall aim is the sustainable development of a country as such, a goal that will surely need time.

The concepts and lessons learned from AR-CDM and voluntary projects could help in designing an effective system for channeling carbon finance into REDD actions which would constitute a contribution to the development of these countries and the protection of their forest cover. But this requires the international community to set the stage and create a more substantial market for REDD action through corresponding climate treaties.

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Methodological Barriers to the Development of REDD+ Carbon Markets

Abstract

REDD+ projects have played a limited role in the voluntary carbon market. This has not been for lack of interest by investors, but rather the result of the slow process by which methodologies are being developed and approved for the monitoring, reporting, and verification of offsets. Differences in the methodology process among different registries and standards have an impact on the quality and consistency of methodologies and ultimately the market's confidence in the quality of offsets. Insights gained since the initiation of carbon markets in the AFOLU[2] sector underlie our suggestion for an improved approach that is designed to produce consistent, transparent methodologies with high scientific and atmospheric integrity, rapid speed of approval, and low costs.

1 This article reflects the views of the authors and not of Winrock International.

2 Agriculture, Forestry, and Other Land Uses.

I. Introduction

Although many of the ongoing international negotiations surrounding REDD+ focus on implementation at a national scale, in reality policies will be implemented at a subnational scale. The efficiency of markets means that an important role exists for projects. Various proposals exist for how subnational activities would work, and these span the range from a freestanding CDM-like system with projects that register directly with the international market to national carbon markets with national registration (Meridian Institute 2009; O'Sullivan et al. 2010).

Serious attention was first given to the possible inclusion of REDD as a mitigation mechanism in the Conference of Parties meeting in 2005, yet project activities started almost a decade before this. For example, under the US Initiative for Joint Implementation (USIJI[3]), many AFOLU projects were reg-

3 http://www.gcrio.org/usiji/index.html

istered in the 1990s. Since then, many REDD and AFOLU-type projects have undergone development (TNC, CI and WCS 2010). It is important to build on these project experiences and identify existing challenges and solutions to move policy forward and increase investment in carbon markets.

The slow pace of verified AFOLU project credits in the voluntary markets has resulted primarily from the small number of methodologies available.

Existing experience with AFOLU projects indicates that the voluntary carbon market can be used to stimulate investment from the private sector. According to Ecosystem Marketplace and Bloomberg New Energy Finance (Hamilton et al. 2010), of the 50 million tCO_2 of over-the-counter transactions in 2009, 20% were for REDD+ activities, accounting for an estimated value of up to US$60 million. Almost none of these offsets would be considered verified emission reductions, as they were not developed, registered and verified relative to an internationally recognized standard. However, for the AFOLU sector to play a significant role in reducing global GHG levels, billions of dollars a year of transactions are needed (O'Sullivan et al. 2010). This will require greater incentives for the private sector to generate the necessary finance by investing in REDD+ activities, and the voluntary market is a good place to start.

The slow pace of verified AFOLU project credits in the voluntary markets has resulted primarily from the small number of methodologies available for the quantification, monitoring, reporting, and verification of carbon offsets that have been approved under an internationally recognized standard. In this paper, we describe the current status of methodology development for the major existing registries and standards; present the process by which methodologies are developed, revised and approved; discuss the advantages and disadvantages of these revision and approval processes; and highlight some key challenges that have hindered methodology development and the approval process. Given that the potential market for carbon projects in the AFOLU sector, and REDD+ in particular, is in its infancy, it is an appropriate time to learn from past experiences to ensure that past mistakes are not repeated. Accordingly we conclude with a proposed approach for methodology development that would reduce costs while maximizing integrity and fostering markets.

II. Methodology development in the AFOLU sector

2.1 The role of methodologies in the carbon market

In the carbon market, offset transactions are recorded a registry where carbon offsets can be bought, sold or retired. Some registries establish their own set of standards [e.g., the American Carbon Registry (ACR) or the Chicago Climate Exchange (CCX)] whereas other standards allow for the use of multiple registries [e.g., Voluntary Carbon Standard (VCS)]. All carbon projects, regardless of how they are registered and transacted, follow a particular standard.

A standard details the requirements, rules and specifications for how reductions in emissions or enhancement of removals from carbon projects are to be quantified, monitored, reported

and verified and is the rulebook to be followed by methodology developers when developing new methodologies. Standards ensure that the carbon offsets generated by a project are scientifically credible and robust, have a real impact on the atmosphere and are fungible. Methodologies are developed and validated to meet the requirements of a given standard for a given project type. A methodology delineates the steps a project developer must follow to demonstrate additionality and the baseline scenario, and describes which GHG sources, sinks, and reservoirs will be included and how they will be measured and monitored to calculate net GHG emission reductions. Some offset systems, which do not allow independent methodology development, combine standards and methodologies into single documents, which are sometimes termed protocols [e.g., Climate Action Reserve (CAR) or Regional Greenhouse Gas Inventory (RGGI)].

2.2 What is the current status of methodology development?

We reviewed nine registries/standards to assess the status of methodology development for the AFOLU sector. These registries or standards cover the majority of AFOLU projects that have been or will be registered for recording and selling offsets (Table 1). Three register regulatory or compliance grade offsets, six register voluntary offsets, and seven currently have registered AFOLU projects.

Table 1. *Summary of main registries and standards available for AFOLU project development reviewed here*

Registry/Standard	Project Locations	Regulatory /Voluntary	Active Projects	Website
American Carbon Registry-ACR	Worldwide	Voluntary	Yes	http://americancarbonregistry.org
Alberta Emissions Offset Registry-Alberta	Alberta, Canada	Regulatory	Yes	http://carbonoffsetsolutions.climatechangecentral.com/offset-registry
Clean Development Mechanism- CDM	Worldwide (developing countries)	Regulatory	Yes	http://cdm.unfccc.int/index.html
Climate Action Reserve-CAR	US	Voluntary	Yes	http://www.climateactionreserve.org
Chicago Climate Exchange-CCX	Worldwide	Voluntary	Yes	http://www.chicagoclimatex.com
New South Wales Greenhouse Gas Reduction SchemeNSW	New South Wales, Australia	Regulatory	Yes	http://www.greenhousegas.nsw.gov.au
North American Forest Carbon Standard-NAFCS	US	Voluntary	No	http://forestcarbonstandards.net
Regional Greenhouse Gas Initiative-RGGI	Northeast US	Regulatory	No	http://www.rggi.org/home
Voluntary Carbon Standard-VCS	Worldwide	Voluntary	Yes	http://v-c-s.org

Across the nine standards or registries we evaluated, there are 164 registered projects as of September 2010, 83 percent of which are registered under CCX and the Alberta Emissions Offset Registry (Table 2). The overwhelming majority (76%) of the projects under these two standards are for carbon sequestration through changes in soil carbon management.

The largest number of methodologies exists under the Clean Development Mechanism (CDM, 17 as of September 2010), 16 of which are, of course, for afforestation/reforestation projects (one is an agricultural methodology for reducing fertilizer use on legumes). As a result, if international discussions agreed to clarify 'enhancement of carbon stocks' under REDD+ to include the forestation of lands that are not currently forested, as Brown and Pearson propose (2009), then a suite of methodologies will be available already for some REDD+ activities.

Apart from the CDM, relatively few methodologies exist under the other standards and registries we considered (Table 2). For REDD+ activities, the VCS and ACR could potentially have many methodologies available in the near future. For example, under the VCS two methodologies have been approved and thirteen are currently under review following the release of their AFOLU standards in 2008[4]. The ACR's Forest Project Standard was released in 2009; one methodology has been approved[5] and two AFOLU methodologies are currently under review.

Table 2. *Comparison of AFOLU standards with respect to the date of establishment of the AFOLU standard, current number of methodologies and projects (in September 2010), and year of approval of first methodology and first project*

	Year AFOLU Category Established	Current Number of Methodologies	Year of First Metodology	Current Number of Projects	Year of First Project
ACR	2009	1 (2 in review)	2010	1	2010
Alberta	2007	4	2007	36	2007
CDM	2004	17	2005	16	2006
CAR*	2005	2	2005	3	2007
CCX	2003	3	2003	100	2003
NSW	2003	1	2003	7	2003
NAFSC	2010	0		0	
RGGI	2006	1	2006	0	
VCS	2008	2 (13 in review)	2010	1	2009

**Including CAR's predecessor organization CCAR (California Climate Action Registry)*

The North America Forest Carbon Standard (NAFCS) has not yet released its standard or methodology. Both market conditions and the current status of the regional emissions cap have prevented the registration of any projects under RGGI, even though the model rule was released in 2006 (Table 2).

4 The two approved methodologies are i) preventing planned deforestation on undrained tropical peat swamp forests in southeast Asia, and ii) improving forest management related to rotation length.

5 Reducing emissions through improved forest management.

III. How are methodologies developed and subsequently approved and revised?

Different registries and standards have adopted various approaches to the development, approval and revision of methodologies (Table 3). These differences can have large impacts on the quality and consistency of methodologies and ultimately on the market's confidence in the quality of the carbon offsets generated by projects through the application of these methodologies.

Table 3. *Summary of the methodology writing and approval steps in each of the registries/standards considered*

	ACR	Alberta	CAR	CDM	CCX	NSW	NAFCS	RGGI	VCS
User Developed	√			√					√
Commissioned/Internal Writing	√	√			√	√		√	
Committee Writing			√				√		
Public Comment	√		√	√		√		√	√
Published Expert Review	√			√					
Auditor Review									√
Independent Board				√					

3.1 Methodology development

Registries and standards can be divided into three categories with regard to methodology development:

1. ***Developed and submitted for approval by users:*** The CDM, VCS and ACR operate a system whereby anyone can develop a new methodology and submit it for approval.

2. ***Developed by an appointed committee:*** A second approach is to appoint a committee to design methodologies in specific sectors. Such committees will typically (and overtly) attempt to balance constituent groups such as the forest industry and conservation organizations. This approach was taken by the CAR and NAFCS.

3. ***Developed internally:*** Alberta, CCX, New South Wales (NSW), and RGGI develop methodologies internally. Although anyone can submit a methodology to the ACR, the ACR also develops methodologies internally.

3.2 Methodology approval

The approval process is divided into four classes:

1. Independent management board approval: The CDM decided to develop a 'Working Group', the Afforestation and Reforestation Working Group (ARWG), to oversee afforestation and reforestation issues. The group is open for application from experts who are selected on the basis of their expertise and experience. Members of the working group are compensated by the UNFCCC secretariat. The nine-member ARWG commissions reviews of each submitted methodology from a pool of experts and, from the reviews, determines which aspects must be addressed by the submitters of the methodology. The opportunity also exists for public com-

ment. Changes are then made by the submitter, and final changes to the methodology are made by the ARWG itself. Methodologies recommended by the ARWG are subject to final approval by the CDM Executive Board (CDM EB).

2. Auditor approval: The VCS has adopted the approach of passing the responsibilities for methodology approval to VCS-approved validation or verification organizations, referred to here as auditor organizations. Any new methodology must be fully approved by two approved organizations relative to the VCS standards.

3. Committee approval: The CAR and NAFCS both develop methodologies within appointed (unpaid) committees, and these are approved through consensus and/or majority opinion.

4. Expert reviewer approval: The ACR uses an external scientific peer-review process for methodology review and approval in combination with public comment. The scientific peer reviewers are selected by ACR from a pool of international subject-matter experts.

5. Internal approval: All other registries or standards have what we would term an internal approval process. This category covers a range of degrees of transparency and may or may not have a period for stakeholder or public comment.

3.3 Methodology revision

The standards upon which methodologies are based evolve, as does the science of monitoring changes in carbon stocks. Furthermore, errors, inconsistencies or improvements can be discovered after initial approval. Therefore, a process is needed for making and approving revisions, although the exact steps vary by registry or standard. One of three general approaches is used for revising methodologies:

1. Independent management board: The CDM's ARWG makes changes continuously to existing methodologies and has also consolidated existing methodologies where significant overlaps exist. Methodology revisions and consolidated methodology recommendations by the ARWG are subject to final approval by the CDM EB.

2. Users: The VCS relies on methodology developers to update methodologies. Methodologies are removed from the approved list when they no longer comply with the latest standard. The developer of the methodology is therefore responsible in perpetuity for keeping the methodology up to date and assumes the accompanying costs in terms of validation or verification and approval. Users who were not the original developers are allowed to submit methodology revisions to the CDM, VCS and ACR, which then require a version of the original approval process.

3. Internal process: The majority of systems rely on an internal process for revision whereby the staff of the registry or standard make any necessary changes, although some systems also require the same public consultation and peer review process as new methodologies (e.g. ACR).

IV. What are the advantages and disadvantages of the various approaches to methodology development and approval?

4.1 Internal processes

Where development of methodologies is internal, the costs are met through internal funds which, although beneficial to the user, limits the diversity of methodologies. For example, RGGI has a single

model rule. CCX has a single set of requirements for each project type (afforestation, forest management, avoided deforestation). In contrast, at the time of writing the CDM has approved fourteen large-scale and seven small-scale methodologies for afforestation/reforestation.

The strength of an internal process for methodology development is that consistency is maintained with respect to both quality and agreement with current requirements. Methodologies are also likely to be written in a generic format, potentially allowing them to be applicable to a large number of projects. However, an internal process immediately opens up questions of transparency. Critics will contend that registries in a competitive marketplace will seek to design methodologies that will appeal to project developers (potentially at the expense of atmospheric integrity) that would ultimately lead to a higher number of registered projects and a higher income from associated fees.

4.2 Committees

In theory, committee processes bring in the inputs of a diverse set of stakeholders and achieve consensus across these diverse viewpoints. However, the reality is that to date committees have been unpaid. Thus those committee members who have much to gain or lose are more likely to devote time and efforts on the methodology approval activities. A balanced initial committee may therefore not to a fully balanced methodology approval. This is exemplified by CAR, which released version 3.0 of its Forest Protocol from its committee in September 2009 and had to release a new version developed internally less than a year later, partly in response to criticisms of the lack of atmospheric integrity.

Additional downsides to the committee approach arise from the associated requirements of time and money. Scheduling groups of twenty or more unpaid individuals makes progress slow, and attempts to achieve consensus across such (diverse) groups makes matters worse. In practice, the registry or standard plays a significant role in terms of scheduling, gathering and processing inputs and in moving the process forward. Ultimately the committee process works out to be significantly expensive even with unpaid committee members.

The strength of an internal process for methodology development is that consistency is maintained. However, an internal process opens up questions of transparency.

4.3 User methodology development

Since all the costs are the responsibility of the user, user-developed methodologies are often developed for a specific project that is currently under development. Thus such methodologies may lack conditions allowing for widespread applicability to other projects. This will limit their use by other projects and/or require multiple methodology revisions by new users.

4.4 Auditor approval processes

The auditor-focused process of the VCS has its advantages. Costs are pushed from the registry or standard on to methodology developers, and the integrity and liability mindset of auditor organizations assists in maintaining a high quality of methodologies. A very real downside for methodology developers is the associated costs. Auditor fees alone can be in excess of US$50,000, and the process can take up to two years. The VCS AFOLU standards were pub-

lished in November 2008, but, as described above, only two AFOLU methodologies had been approved by September 2010.

These costs in the time and money involved in approving methodologies results from the exacting requirements of the auditing organizations. Each organization typically has multiple reviewers with different levels of expertise and perspectives who require close adherence to the standard and high precision in terms of language and justification for selected approaches. However, based on our collective experience, there is considerable opportunity for variation among auditors with respect to levels of scientific and technical expertise. This disparity leads to inconsistencies in the number and types of corrective action requests that an auditor may require before approval and thus to inconsistencies in the quality of final approved methodologies. Some auditors place particular emphasis on the scientific and technical aspects of the methodology, while others minimize their review of these aspects and focus mainly on adherence to the standard in question, as well as inconsistencies and typographical errors.

Auditor fees alone can be in excess of US$50,000, and the process can take up to two years.

There are obvious advantages and disadvantages for a methodology developer in choosing an auditor with extensive technical expertise. On one hand, a methodology that is subjected to additional scientific and technical scrutiny by the auditor will be improved as a result of the validation process, but the approval may come only after several rounds of reviews. This ultimately slows down the overall process. On the other hand, methodologies that are subjected to less rigorous review from a technical standpoint may be approved quickly, but any conceptual errors that slip through will ultimately limit their credibility and applicability to AFOLU projects. The use of methodologies that are inconsistent in quality could lead to lower confidence from investors in the quality of the offsets generated by projects in the voluntary sector.

The final disadvantage of the auditor process is in the long-term status of methodologies. As the VCS standard evolves (e.g. it was updated in May 2010), previously approved methodologies become invalid (although grandfathered in for some fixed time). The VCS then would require the methodology developer to meet the costs of updating the methodology and potentially putting it through a new double auditor review. In recognition of the high costs foisted on developers of methodologies, the VCS is designing a system whereby projects that use existing approved methodologies will pay a royalty to the initial developers for the right to use the said methodologies. However, in some circumstances the initial methodology developer may lack the resources or incentive to update the methodology, potentially resulting in select methodologies being permanently removed.

4.5 Expert peer review

The scientific peer-review process as used by ACR for methodology approval relies on recognized experts in the relevant field and is conducted blindly so that peer reviewers can make methodological decisions without influence from methodology developers. The costs of methodology development are still the responsibility of the user, but this approval process generally results in low costs to implement ($30,000 or less) and

a short time from methodology submission to approval (3-6 months) compared to an auditor-based approach. However, peer reviewers are selected by the registry, which opens up questions about impartiality, and the group of peer experts may include reviewers with a strong knowledge of the specific scientific field (e.g. soil carbon cycling) but less understanding of carbon projects and carbon markets. In addition, the entire process consists of just two to four individuals, with a single lead reviewer who has ultimate control over the process. Although the peer-review process is also used in other systems (notably by the CDM's ARWG and by auditors for VCS methodologies), it is generally part of a larger, more complex process that contains additional steps in approval.

4.6 Independent managing board

In our view, the approach of the independent board that has been used by the CDM is a balanced approach for the development and approval of methodologies. The independent expert board maintains integrity and transparency and can ensure that methodologies meet a consistent standard and immediately meet the latest decisions and changes in standards. Additionally, the costs of methodology approval are met by the CDM itself, substantially reducing financial outlay for the methodology developer user. For an independent standard or registry to mimic this approach, these costs would have to be met by the methodology developer unless financial turnover is as high as the CDM achieves. The independent board approach has the added advantage of continuously being able to design tools and methodological elements to facilitate methodology development and the subsequent project processes.

The disadvantage of the independent board was felt in the earliest years of the CDM when the ARWG acted as a significant bottleneck, with eighteen new methodologies being submitted to it before the first was approved. This early bottleneck no longer exists due to increases in ARWG efficiency, but probably more significantly to decreases in methodology submission rates.

V. Methodological challenges

The development and subsequent approval of methodologies for AFOLU projects, particularly for REDD activities, has been slow, yet this is not linked solely to the weaknesses of the systems and processes that are in place among the various standards and registries. Below, we discuss three challenges that have hindered the process of methodology development and approval.

Challenge #1: A changing goalpost

Perhaps the biggest challenge for AFOLU carbon projects in the voluntary sector has been the rapid and constant evolution of standards and methodologies to which projects are expected to adhere. Change is inevitable, but the speed at which the voluntary AFOLU sector has evolved has made it difficult for a methodology to be developed and approved quickly. Unlike the CDM in the regulatory sector, there has been no clear 'leader' in terms of AFOLU project development in the voluntary sector. Each standard or registry has its own specific set of requirements and procedures for methodology development and approval, which continue to evolve as they are tested under practical circumstances.

For example:

- The VCS released its AFOLU Standards in November 2008, updated them in May 2010 and will update them again in early 2011;
- The American Carbon Registry (ACR) released its Forest Carbon Project Standard Version 1 in March 2009 and Version 2 in June 2010;
- The CAR has updated its Forest Project Protocol as follows: Version 1 in June 2005, Version 2.1 in September 2007, Version 3.0 in September 2009, Version 3.1 in October 2009 and Version 3.2 in August 2010.

This 'changing goalpost' mentality – i.e., methodologies are constantly revised to adhere to ever-changing standards, and projects are constantly revised to adhere to ever-changing methodologies – have made the process difficult and time-consuming. Furthermore, since the methodology process has been slow, AFOLU projects already underway have often use currently approved or unapproved draft versions of methodologies to collect the data and perform the calculations necessary for project validation and verification. As methodologies change, there are potentially large consequences for projects that are applying the methodology. Project developers must then decide whether to alter the project implementation or submit a methodology revision, thus increasing costs and time before the project can be validated. Changes may be as simple as collecting additional project data, but in more extreme cases methodological changes can significantly lower the number of expected credits or prevent the project from using the methodology altogether. Standards and registries partially mitigate the 'changing goalpost' problem by allowing projects developed under a currently approved standard or methodology to continue using that version until some specified deadline for validation or registration.

Challenge #2: Limited bench strength

Another challenge that has limited the development and approval of methodologies to date has been the limited number of experts in the AFOLU sector. The majority of methodologies are developed by the same people who have been members of the CDM ARWG, authors or reviewers for the VCS and ACR standards, and who have sat on committees for CAR, the NAFCS, etc. The same people are often the experts consulted when methodologies are being reviewed for approval. This strain on human capacity has resulted in a bottleneck with respect to the number of methodologies that can be written and approved at any given time. Also, a handful of experts can have only a finite number of practical experiences on which to base their thinking, which could lead to 'tunnel vision' when developing new methodologies. Experts in the science of agriculture and forestry certainly exist, but very few have jumped the divide between academic research and applied science in the context of carbon project development.

Challenge #3: Methodology applicability

The fact that methodologies are often developed by project developers means that they are frequently developed with a specific set of project circumstances in mind. This is often reflected in the 'applicability conditions' listed at the beginning of a methodology, i.e., 'this methodology is applicable only under the following circumstances', followed by a laundry list of exclusionary and/or inclusionary conditions. One potential consequence of this approach is that, by the time a methodology has been approved and is being used for the project for which it was developed, it may be so specific to the project that its applicability to other projects has become severely limited.

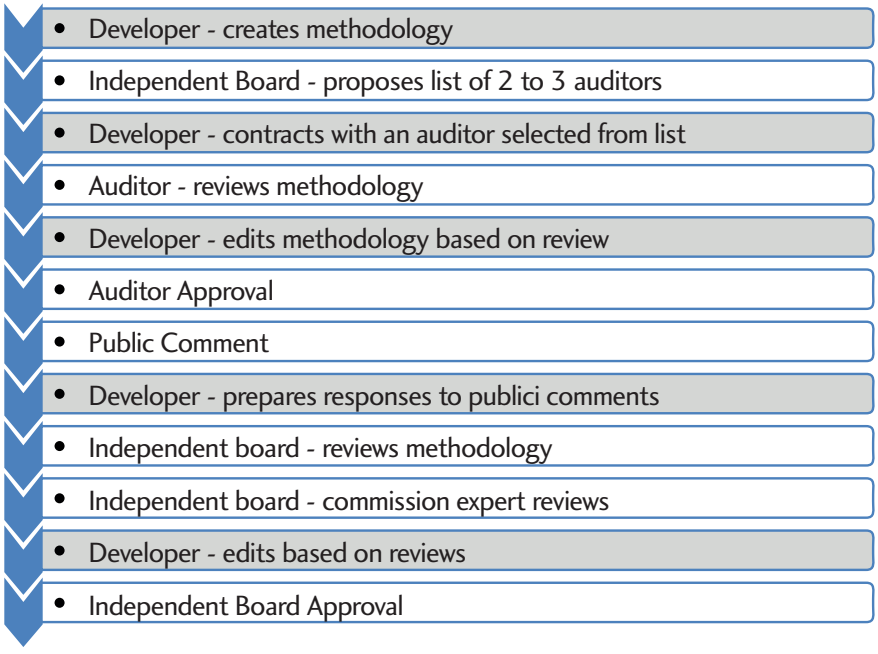
At the other end of the spectrum, methodologies that are developed without specific projects in mind run the risk of getting through the approval process without being subjected at all to 'real-world' testing. Project developers hoping to apply a methodology after it is approved may discover that it is not feasible, practical, or cost-effective to implement, despite the fact that it is technically sound. Methodologies must therefore strike the right balance between scientific integrity, practicality and cost-effectiveness. Along these lines, both the CDM and voluntary schemes have moved away from narrow, project-specific methodologies and towards the development of broader 'tools' and 'modules' that can be used by a range of projects to fulfill certain methodological requirements. For example, the CDM has fifteen 'tools' that can be incorporated into various sections of a methodology and thus reduce the effort involved in developing and approving a new methodology. Another example is seen in the current REDD modules under development by AD Partners:[6] depending on a project's specific circumstances, different modules are chosen and combined in unique ways to develop a customized methodology that suits the needs of the project.

VI. An approach that will foster market development

Many lessons and insights have been gained since the initiation of the market for carbon offsets in the AFOLU sector. Building on these lessons and insights, here we present an improved approach, summarized in Figure 1, which is designed to allow for:

- Consistent, transparent methodologies with high scientific and atmospheric integrity;
- Increased speed of the approval process; and
- Reduced costs.

Figure 1. *Proposed design for a methodology approval process that would maximize integrity and cost efficiency*



6 http://www.adpartners.org/initiatives_redd.html

At the center of our proposed approach is an independent board, appointed and paid by the registry or standard, to ensure methodological efficiency and integrity. Such a board would maintain consistency both among methodologies and with the standard, and would ensure conservatism with regard to atmospheric impact. The board should be appointed based on expertise, and should be paid to ensure that the best candidates apply and that the work undertaken can be completed in a timely manner. To limit costs, the board could be comprised of no more than three to four people. We suggest overlapping three-year terms both to ensure continuity and to bring in fresh ideas and energy. To display integrity and transparency, the standard/registry should post the CVs of board members and allow open applications for new board members.

Our proposed system promotes the development of methodologies by users to allow for maximum stakeholder input and diversity in the methodologies produced. After the methodology has been developed, the approval process would involve (in the following order):

1. Review by an auditor
2. Public comment
3. Review and approval by the independent board

The thoroughness and integrity of auditor organizations has brought great value to methodologies reviewed under the VCS. As discussed in Section 4.3 above, its weakness lies in variability among auditors and the costs of the double-approval review process. To ameliorate these weaknesses, we propose a single-auditor review process with an additional role for the independent board to evaluate the quality of auditor reviews and maintain a list of favored auditors. One potential approach could be that the independent board permits the methodology developer to choose from among two or three auditors, and the developer would contract directly with one auditor. A comparable approach exists under the CDM, whereby expert reviewers are given a score by the ARWG of from 1 to 10 for each review undertaken. Subsequent reviews are assigned to the highest-rated available reviewers.

The independent board should assess the auditor's review with respect to agreement with the standard, reasonableness of calculation approaches and atmospheric integrity with future application of the methodology. Assessments should consider not only conservativeness but also breadth of applicability and the 'project-proponent friendliness' of methodologies. The developer of the methodology would then make changes based on the auditor's requirements.

The VCS requires that one of the auditors use an expert from a list maintained by the VCS itself. The reality of the approval process to date has been that auditors hire multiple expert reviewers, regardless of this VCS requirement. The independent board's assessment of auditors would further underline this integral quality in the audit process and thus remove any need for 'approved experts'.

After auditor approval, we propose that the next step should be to set aside a period for public comment on the methodology. Public comment allows potential future users to raise issues with regard to the applicability of the methodology. The developer should prepare responses for the independent board on the public comments received. Since under existing approval processes (e.g. ACR, CDM, or VCS) public comments come at the very beginning of the approval process, interested parties are typically comment-

ing on a version of the methodology that bears little resemblance to the final version. Moving the public comment period after the auditor approval process should reduce the overall number of public comments that a methodology developer will need to address, thus reducing time and cost.

The final step in the approval process would lie with the independent board. The board would either review the methodology and decide to approve it or request additional changes prior to approval. The board should have the freedom to commission expert review of specific technical facets which members do not feel fully qualified to evaluate themselves. To help cover the costs of the board's review, methodology developers would pay a direct fee to the registry or standard for the process.

Subsequent methodology revisions, methodology consolidation and methodology withdrawals would lie with the board (as under the CDM). The registry or standard could provide support for the board to undertake specific directed activities such as editing and formatting. Users and developers would also be able to request or propose revisions that would subsequently pass through the board. Much of the work of the board could be conducted using teleconferences. However, an in-person meeting a couple of times a year to discuss progress in methodology and to prepare tools and guidance for developers would have great value.

The approach of the CDM that includes reliance on the independent board has much merit but requires significant resources to maintain a nine-member board. We suggest that an auditor can fill some of this role. The VCS uses auditors in methodology approval, but the requirement for two auditors increases time and cost, and without an overseeing board there is no guarantee of consistent quality.

Table 4. *Summary of the cost, time and perception of quality/integrity between the proposed approach and the ACR, CAR, CDM and VCS.*

	Writing Methodology		Approving Methodology		Total Methodology Writing and Approval Process		Perception of Quality / Integrity
	COST	TIME	COST	TIME	COST	TIME	
Proposed Approach	↓	↓	↔	↔	↔	↔	↑
ACR	↓	↓	↓	↓	↓	↓	↔
CAR	↑	↑	↓	↓	↑	↑	↔
CDM	↓	↓	↓	↔	↓	↔	↑
VCS	↓	↓	↑	↑	↑	↑	↔

Note: ↑ = high; ↓ = low; ↔ = intermediate.

We believe that the approach presented here will allow for a balance between transparency and a high level of integrity, as well as between the speed and cost of development (Table 4). In this way, approved high-quality methodologies would be available for use by the wider community, leading ultimately to the implementation of a higher number of registered forest-based carbon projects and an increase in private investment in these mitigation activities.

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Section 2

Future Role of the Carbon Market and the Private Sector

Charlotte Streck[1]
Climate Focus

Financing REDD+ and the Role of Carbon Markets

Abstract

Emission reductions from tropical deforestation are central to cost-effective GHG mitigation to keep global temperature from increasing beyond 2°C above pre-industrial levels. Reducing emissions from deforestation and forest degradation (REDD), conservation and the enhancement of forest carbon stocks (together: REDD+) promises to lower the cost and increase the potential of international mitigation efforts. While being comparatively cost-efficient, the resources needed to reduce deforestation are significant. Estimates to halve emissions from deforestation range from USD15-33bn per year. It is unlikely that public sources alone will mobilize such level of finance. Linking REDD+ to carbon markets is one way to mobilize additional finance for policies and programs that reduce deforestation. However, carbon markets carry market, environmental and social risks that make a careful design and supervision of market-based REDD+ finance necessary. Solutions to manage REDD+ markets involve the management of supply and demand of credits. Environmental and social benefits of REDD+ need to be guaranteed through safeguards, participatory approaches and transparency that support legitimate and sustainable REDD+ policies.

1. Introduction

REDD+ is a process that implies the design of low emissions development strategies and the adoption of a new land-use paradigm, all of which costs money and draws on a country's resources. Before moving to full-scale REDD+ implementation, countries need to go through a process of policy design, consensus building, testing and evaluation. Government ownership of the process and commitment from key actors in a country are essential prerequisites for successful REDD+ implementation. Varied and flexible financial instruments that produce adequate, predictable, and sustainable resources are required to support such a process. The different financial instruments of a REDD+ mechanism may correspond to different phases, which could include:

- A support mechanism that allows countries to access immediate funding for national REDD+ strategy development (REDD+ readiness funding).
- A fund-based mechanism that allows countries to access funding based on agreed criteria.

1 The author would like to thank Eszter Szocs for her research assistance in preparing this article.

- A mechanism that rewards performance on the basis of forest emissions and removals against agreed reference levels in accordance with the CO_2 equivalence metrics (Angelsen et al., 2009).

While the first two phases would be funded by public funds, the third phase could be open to market-based funding, provided that emission reductions are converted into tradable carbon credits. This article reviews the opportunities and risks associated with mobilizing finances for REDD+ through international carbon markets. After describing the financial needs for significantly reducing emissions from deforestation, the paper will summarize the potential of carbon markets to contribute to these needs. This paper will summarise the issues that need to be taken into consideration in the design of a market-based REDD+ mechanism to avoid perverse outcomes and ensure an effective REDD+ incentive system.

2. REDD+ financing needs and fund sources

The success of any REDD+ mechanism will have to be measured against its capacity to reduce emissions from deforestation and forest degradation. The core of any REDD+ strategy is thus the proposed policies and measures to protect threatened forest and neutralize any drivers of deforestation and forest degradation. The costs of the implementation of such policies determine the financial needs of a REDD+ mechanism, that is, the amount of funding that has to be made available to cover the various costs for achieving certain level of emission reductions.

2.1 REDD+ costs

REDD+ programme costs will vary in nature, and amounts will differ significantly between countries and activities. Ongoing REDD+ costs fall into two categories: preparation costs and implementation costs (Table 1).

REDD+ readiness costs include the development of REDD+ strategies, an implementation framework, and a system to monitor, report and verify (MRV) the implementation of REDD+ programs. REDD+ implementation costs are the costs of implementing policies and measures inside and outside the forest sector. Examples include forest monitoring, tenure reform, law enforcement, taxation of forestland, restrictions on road building and agricultural zoning. Implementation costs include opportunity costs that arise from foregone profits from deforestation or the costs of adopting more sustainable forest use. These costs vary across space and time: opportunity costs are higher where markets are accessible and when expanding forest protection (e.g. REDD+) increases agricultural intensification. Nevertheless, low opportunity costs do not necessarily imply cheap REDD+ activities, since such activities are often found in areas with the greatest challenges in forest policy implementation, administration and monitoring (Eliasch, 2008).

The opportunity costs of REDD are projected to be USD 20-30bn/year, although estimates vary widely as they rely on complex models and changing commodity prices which affect the value of different land uses. The UNFCCC estimates developing countries' opportunity costs at USD12.2bn for REDD and the investment needs for sustainable forest management at 8.2bn annually (Eliasch, 2008). To achieve a 50% reduction in deforestation, the 2008 Eliasch review estimates USD 17-33 bn/year in REDD costs by 2030; the European Union estimates 15-25 bn/year. Figures are even less predictable once the program cost of policies and measures, governance and legislative reforms, transaction costs and the effectiveness of policies are taken into account. Yet it is clear that current expenditures in the forestry sector are inadequate. Reducing deforestation globally depends on new in-

vestment measured in the billions of dollars or Euros, yet between 2000-2005 global official development assistance (ODA) to the forestry sector amounted to less than EUR600 million per year (Simula, 2008).

The real net costs of REDD+ include opportunity costs as well as REDD+ readiness and other implementation costs. REDD+ is commonly presented as a cost-efficient mitigation strategy. Numerous analyses of REDD+ opportunity costs need to be supplemented by opportunity cost analyses of greenhouse gas (GHG) emission reduction in all other sectors where it can take place, and importantly include a close analysis of the specific additional actual costs of successfully implementing the activities, policies and institutions to carry out the deforestation reduction.

Table 1. *Summary of REDD+ needs*

Costs / Description	REDD preparation costs		REDD Implementation Costs	
	Readinessand Upfront Costs	**Ongoing capacity building and institutional strengthening costs**	**Policy and Measures**	**Payment for Ecosystem Services, subsidies, direct REDD+payments**
Objectives	Enabling participation in REDD +, appraising policy options, establishing strategy and consensus	Maintaining the ability to successfully implement REDD + activities	Reduction of emissions, improvement in forest governance and forest management	Compensate for the opportunity costs of REDD+
Features	No or little direct effect on land use emissions		Effect on emissions less direct and with delay, initial funding can have leveraging role	Performance -based payments, most likely voluntary, nationally or sub-nationally administered
Funding needs	Upfront funding Most likely non-market finance		Upfront funding Potential mix of performance -based and fund -based funding	Lends itself to performance -based financing

2.2 Sources of REDD+ finance

Funds for a REDD+ mechanism would have to be made available by governments voluntarily or be raised via international mechanisms. International mechanisms include fee-based, market-linked and market-based mechanisms. International funding would complement domestic funding. Developing countries are expected to share the cost burden associated with national REDD+ strategy development and implementation, in accordance with their respective capacities, and many have already been doing so[2]. There are two broad categories of financing mechanisms:

- Public sources: these are provided through domestic public finance or ODA;

2 E.g., Brazil, China, Mexico, Costa Rica, Gabon, among others

- Private sector and carbon market finance: these are either financed domestically through the private sector or internationally through foreign direct investments (FDI), non-profit finance or finance through carbon markets, both regulatory and voluntary (see also Table 2).

Table 2. *Existing and potential finance sources for REDD+*

PUBLIC FINANCE	
Type	**Description**
Traditional ODA for forestry	• Increasing; rose 47.6% since 2000 and totalled almost USD 2 billion in 2005-07; • Provides grants, concessionary loans, shorter-term financing for specific projects and longer-term programme financing or budget support; • Also interested in co-benefits related to poverty reduction, biodiversity conservation and improved governance.
New ODA for REDD+	• Recent emergence of new REDD+-related finances that draw all or part of their revenues from international public finance sources; • Since COP 15 of the UNFCCC, additional funds of 4bn USD have been pledged as fast-track REDD+ finance.
Domestic	Limited domestic public financing for forestry from taxes and royalties; typically used for subsidies and other incentives; sponsoring of environmental services in forests.
PRIVATE SECTOR AND CARBON MARKET FINANCE[3]	
Existing carbon market	Two components: voluntary and compliant (current compliance markets excludes REDD+)
Future carbon markets	Regional and domestic markets may also consider using REDD+ credits for compliance.
Foreign direct investment	Flows to forest sector have increased by 29% from USD 400 million in 2000-02 to USD 516 million in 2005-07 (World Bank, 2008)
Domestic	Public-private partnerships or microcredit schemes; Unlikely to be significant, especially in least developed countries, due to low level of resources, lack of expertise and difficulty raising finance from risk-averse domestic banks.
Non-profit and philanthropic	Represents growing proportion of international private finance; typically small, narrowly targeted grants that may not have wide REDD+ applicability; non-profits are interested in REDD+ and may be less risk-averse than profit-making enterprises.

Source: Adapted from Dutschke et al. (2008) Hamilton et al., 2010.

3 Annex I government purchase of REDD credits as offsets on carbon markets is included in the private sector finance, as the carbon market is principally considered an approach for attracting private investment, and it is difficult to estimate share of government purchase of credits on the carbon market.

The private sector and FDI does not traditionally have a strong presence in forest resource management in developing countries. The forest sector is characterized by (i) domestic investments; (ii) variable levels of FDI; (iii) insufficient and inadequate regulation that depresses incentives for investing; and (iv) inadequate incentives to improve management practices. This is compounded by insufficient public investment in forest conservation and natural forests. These challenges are not insurmountable in a REDD+ mechanism: REDD+ should be designed to provide a strong financial incentive to improve forest governance and management and stimulate FDI and other investment in the forest sector in developing countries.

In the last few years, some new international public fund for REDD+ has emerged, including facilities that seek to leverage private-sector finance such as the World Bank's Forest Carbon Partnership Facility, the Climate Investment Funds (Forest Investment Program) or the UN-REDD programme and sources aimed at building public-sector capacity, such as the Congo Basin Forest Fund.

The future of the carbon market for the main avenues of REDD+ under discussion includes: 1) integrating REDD+ into a global compliance carbon market; 2) allocating auction proceeds; and 3) allocating revenues from other fees, fines and taxes.

Foreign direct investment may constitute an important source, but it is unevenly concentrated in low-risk countries with profitable forest industries.

3. Carbon markets and REDD+

It is unlikely that public funds can provide the level of funding required to halt deforestation. Tapping into private capital is therefore a necessary condition to bring REDD+ finance to an adequate level. A REDD+ mechanism could foresee the conversion of emissions reductions from REDD+ actions into carbon credits that can then be sold to industries or countries for compliance. Such an approach is generally associated with market-based REDD+ finance.

3.1 Forest carbon markets

The voluntary market has enjoyed significant growth over the past couple of years and is likely to grow even further in the future, despite uncertainties regarding the impact of a post-2012 REDD+ scheme. But voluntary offsets remain a niche for corporate social responsibility and environmentally aware consumers. Prices are generally lower than in compliance carbon markets. Combined with insufficient liquidity, the amounts traded are not sufficient to stimulate any larger investments in the land-use sector. At least 387 million tons of carbon credits were transacted in the voluntary market in 2009, a tiny fraction of the 143,897 million tons traded in regulated markets (Hamilton et al., 2010). While voluntary carbon markets can be used as a testing ground for ideas and methodologies, they cannot mobilise the funding needed to support REDD+.

The ultimate financial volume generated through tradable REDD+ credits is a function, inter alia, of the depth of emission reduction commitments from industrialized countries, the fungibility of REDD+ credits on the carbon markets, and the details of the REDD+ rules and governance. Depending on the architecture of the eventual REDD+ mechanism, compliance grade REDD+ credits could be acquired by countries or, if fungibility is guaranteed, by private entities for compliance with national emissions targets. Demand established by industrialized coun-

tries and private entities will determine the viability, scope and size of regulated carbon markets, while the voluntary market is likely to retreat to the niches not occupied by the regulated market.

3.2 Emerging REDD+ market mechanism design

When designing a market-based international REDD+ mechanism, two basic options exist: greenhouse gas emission reductions could be measured against an agreed reference scenario, and REDD+ credits could be issued ex-post after the environmental benefits have accrued and been measured and verified. Alternatively REDD+ credits could be issued ex-ante based on an agreed reference level of emissions. A country could sell REDD+ credits to raise funds or allocate units to sub-national actors. The country would, however, have to ensure that the amount of units it sells should not exceed its real reductions. At the end of the crediting period the country would have to make sure that its emissions from deforestation and forest degradation should at least reach the REDD+ credits it has obtained on ex-ante.

It is unlikely that public funds can provide the level of funding required to halt deforestation.

Where REDD+ credits are allocated upfront, they would resemble the Kyoto Protocol's Assigned Amount Units (AAUs); where they would be allocated against reference scenarios ex-post, they would be generated like the Certified Emission Reductions of the CDM. While most proposals suggest an ex-post crediting for REDD+, the national scale of REDD+ would imply that the link to the compliance market would be led by government-to-government transactions, in the spirit of Article 17 of the Kyoto Protocol (emissions trading), with the Annex I Party's role limited to purchasing REDD+ credits. Non-Annex I Party governments may also decide to devolve incentives to domestic REDD+ actors, either with cash payments for environment services, or through a mechanism similar to Joint Implementation whereby the government approves projects that cause demonstrable improvements in the national greenhouse gas inventory of the forest sector. Non-Annex I Party governments may also choose to deliver REDD+ credits to foreign partners through green investment schemes, as several eastern European countries have envisaged to sell their surplus Assigned Amount Units in the first commitment period of Kyoto Protocol.

4. Risks and their mitigation through proper REDD+ market mechanism design and implementation

Linking a REDD+ mechanism to private sector-driven carbon markets holds the potential to create market incentives for investments in REDD+ actions and align the interests of many private-sector entities, NGOs and local actors to reduce deforestation. However, raising funds via carbon markets for REDD+ action also entails environmental, social and economic risks. Most of these risks can be mitigated through a robust design of the mechanism, market regulation and supervision, and compliance checks and enforcement of provisions in the implementation of REDD+ mitigation actions, projects and programs. The following section lists the main issues that need to be considered in developing and implementing a REDD+ mechanism.

4.1 Demand and supply uncertainties

A REDD+ market mechanism faces the dilemma that participant REDD+ countries will have to sell REDD+ credits to cover their costs, while potential buying countries have a wide array of choices regarding how they meet their emission reduction commitments. Demand is therefore hard to gauge. The supply of REDD+ credits is also uncertain and difficult to assess precisely. Estimates of mitigation potential from REDD[4] range from 2.6 $GtCO_2e$ per year by 2030 (Eliasch, 2008) to 3.3 $GtCO_2e$ per year by 2030 (Vattenfall, 2007), to 3.5 $GtCO_2e$ by 2050 (Stern, 2007). However, the mitigation potential is not synonymous with the generation of tradable REDD+ credits.

The theoretically low abatement cost for REDD+ (McKinsley, 2009) has triggered concerns that opening REDD+ to carbon markets would lead to a flood of credits, thus disincentivizing emission reductions in other sectors, a concern shared by a number of NGOs (Livengood et al., 2009). For this reason, the EU Commission favours a fund-based compensation model over a market for REDD credits (EU Commission, 2008). However, the generation of REDD credits is not linear to its abatement costs. A rapid build-up in the supply of REDD credits is limited by (i) the ability of developing countries to meet the criteria to participate in an international market mechanism; and (ii) the challenge of implementing the right policies and actions to reduce deforestation and forest degradation. It further depends on the way how reference levels are set.

If demand is set too low or is uncertain, this may negatively affect supply, but it also opens up the risk of market flooding. If demand is set too high, any problems with supply will drive carbon prices to unacceptably high levels. These uncertainties surrounding the supply and demand of REDD+ credits produce a number of potential risks, including market flooding, price volatility, and the timing of unit issuance. A number of solutions to address the above supply and demand risks have been proposed. A selection of these proposals is summarized and analysed below. Each of these possible solutions has advantages and limitations, and many of these can work together. The most appropriate response to market risks may therefore consist of a collection of solutions:

- **More ambitious emission reduction commitments.** A condition for the creation of tradable, compliance-grade REDD+ credits is the tightening of quantified emission reduction/limitation obligations. More ambitious commitments would increase demand for REDD+ credits and create the necessary incentives for further reductions in deforestation. They would, however, lead to price spikes and increased costs of compliance (and potentially a failure to comply with stricter caps) if the projected REDD+ credits are not in fact generated.
- **Controlling overall supply.** An amount of AAUs equivalent to the expected number of REDD+ credits to be generated over a given commitment period could be put into an escrow account within a registry account managed by the UNFCCC registry administrator. One AAU would be cancelled for each REDD+ credit issued. If the account holds more AAUs than REDD+ credits issued, excess AAUs would be released into the market. They could either be sold or assigned to Annex I parties according to their percentage in the overall amount of

4 As there are no studies that estimate the full REDD+ potential, the following numbers relate to REDD estimates only.

AAUs. If more REDD+ credits are generated than AAUs held in the reserve account, the REDD+ credits could be banked for future periods and taken into account in the context of new rounds of negotiations. This solution ensures that the overall cap on emissions is not affected. It also controls the total supply of credits available. This solution would require fungibility between AAUs and REDD+ credits to avoid market distortion.

- **Ensuring demand.** Demand for REDD+ credits can be guaranteed by purchase commitments. Countries could make binding commitments to meet a certain percentage of their emission reduction commitments with REDD+ credits. Such commitments could be split into two components, the first being an absolute commitment independent of REDD+ and the second being specific to REDD+. If REDD+ credits are not generated, the commitment could either be reduced to equal the number of REDD+ credits generated, or rolled into a second commitment period. Opening private carbon markets for REDD+ is another means to ensure demand. Other than sovereign buyers that are exposed to a wide number of political constraints, private market players are likely to embrace cost-efficient offset opportunities.
- **Cap imports of REDD+credits.** Limitations on the number of REDD+ credits eligible for compliance can be used to stem a flood of REDD+ credits. This cap could be imposed both within the international rules and within any domestic emissions trading scheme. Limitations on the use of offsets apply to the EU emission trading scheme and other domestic and subnational emission trading schemes. These limitations control the use of imported units and help maintain overall market prices within the regulated system. Caps may shield the depression of market prices, as they reduce demand for REDD+ credits. At the same time, they remove the incentive to engage in further REDD+ actions. Caps may therefore depress the price of REDD+ credits compared to other units and reduce further the amount of funding going into reducing emissions from deforestation.
- **Issuance during commitment periods.** The problem of a sudden spike in supply associated with ex-post crediting at the national level can be mitigated by the continuous issuance of REDD+ credits during commitment periods. REDD+ credits could be issued to authorized and approved subnational activities that have generated certified emission reductions or removals. The continuous issuance of REDD+ Credits (via an international body or the participant REDD country) would release credits continuously and in quantities that are unlikely to generate sudden shocks. REDD+ credits released on the account of a participating REDD+ country would have to be deducted from the overall balance of REDD+ credits issued for that country at the end of the commitment period.
- **Price floors and ceilings.** A floor price for REDD+ credits could be agreed between the Parties to ensure that sufficient funding is available to support REDD+ initiatives. A price ceiling could limit the exposure of potential buyers to carbon price volatility. The price floor/ceiling could be enforced via the commitment to purchase or sell REDD+ credits when there is oversupply/undersupply. Price floors and ceilings reduce market risk for participant REDD+ countries and potential buying countries

respectively. However, the cost of enforcing a fixed floor price for REDD+ credits will be unclear at the time it is agreed. This could be addressed through complementing a floor price with a cap on the total amount of funding spent on maintaining the floor, and/or capping the total number of REDD+ credits allowed in the market.

4.2 Social and environmental concerns

Concerns exist in relation to private-sector engagement in REDD+ where the quest for financial returns is allowed to compromise environmental integrity. The concerns that private-sector finance will endanger the environmental goals of REDD+ projects have to be managed through careful design and regular review of the process.

Social risks. Civil society and indigenous peoples' organisations point out that there are still risks that are ill-conceived and that investor-driven REDD+ projects could harm communities and generate perverse outcomes. There is a danger of customary rights being violated in the interests of inward investment and of abusive contracts and land speculation acting to the detriment of community interests. Thus without clear tenure and use rights, sustainable forest management will be impossible, and carbon finance may increase social conflict (Eliasch, 2008). In addition, rushed projects and REDD+ initiatives often fail to properly consult and obtain consent from affected forest communities (Griffiths et al., 2009). Problems with weak governance and corruption in the forest sector in developing countries and widespread unjust treatment and exploitation of forest communities by government forest-departments aggravate the problem.

Well-designed REDD+ markets can help mitigate the identified risks by allowing the bottom-up development of projects and programs by forest communities, indigenous peoples and other rural communities. Rather than being dependent on payments from failing and unreliable governments, REDD+ may allow local stakeholders to directly access finance that supports the stewardship of forest resources. To empower local stakeholders, the latter need to participate in forest policies and have the right to develop and administer REDD+ programs. A rights-based approach would enable local communities to strengthen their standing vis-à-vis government authorities. It is therefore essential that a REDD+ mechanism is supported by governance reforms that clarify land title and establish robust tenure systems. Strong safeguards for an international REDD+ mechanism would further have to ensure transparency, full consultation and the fair implementation of REDD+ action by national and international actors.

A rights based approach would enable local communities to strengthen their standing vis-à-vis government authorities. A REDD+ mechanism must be supported by governance reforms that clarify land title and tenure systems.

Environmental risks. A badly designed REDD+ mechanism could create incentives to replace primary forest and other biodiversity-rich ecosystems with plantations of secondary forest that were rich in carbon but poor in species. In addition, a REDD+ mechanism that emphasizes reducing deforestation rates will lead governments and market forces to focus on areas of threatened forest that are cheapest to protect. Tropical moist forest hotspots retain only ~10% of their original forest (Mey-

ers et al., 2000) and have high rates of human population growth (Cincotta et al., 2000). Protection costs will be much higher than for forest elsewhere, such as the Amazon, where at present ~85% of the forest remains (Grainger et al., 2009). Developing countries with limited human and financial resources may focus on protecting carbon-rich forests to meet their REDD+ targets, even if this undermines other ecosystem services and social welfare (Grainger et al., 2009). Finally, the promotion of biofuels could deal a serious blow to REDD+ by creating incentives to clear tropical forests to establish biofuel plantations.

In order to achieve protection of tropical forests and their biodiversity while reducing GHG emissions, countries need to adopt policies that promote the integrated management of carbon and biodiversity. Eventually a system that foresees simultaneous payments for carbon storage and biodiversity protection may create an appropriate incentive system for sustainable, integrated land management. Before such system is in place, parties to the UNFCCC should adopt safeguards that make the biodiversity impact of REDD+ policies and programs a part of required environmental impact assessments. While carbon markets are blind towards the biodiversity benefits of REDD+ investments (or the biodiversity value of REDD+ credits), national and international safeguards can determine the eligibility of investments, policies, programs and projects for generating REDD+ credits.

In sum, the promotion of participatory approaches and pro-poor policies, improvements to the adaptation capacity of forests to climate changes, maintenance of species migration routes, and the avoidance of self-enforcing negative impacts of climate change will have to become integral elements of REDD+ implementation. International safeguards that are mandatory for UNFCCC parties can extend to private investors, either where REDD+ Credits are issued internationally or where countries have integrated relevant safeguards into national laws. A balance will need to be trodden between certainty for investors and certainty of the environmental outcomes. Eligibility criteria can exclude high-risk and unsustainable projects, programs and other activities; ongoing requirements can ensure the long-term sustainability of REDD+ activities.

5. Concluding remarks

Carbon markets have significant potential to raise finance for REDD+ action. Private sector (for-profit and non-for-profit) initiatives are essential to mobilize the required amount of finance and the creation of incentives for all levels of society is the key to a robust REDD+ mechanism. However, carbon markets are no panacea for REDD+. The availability of finance depends on ambitious emission reduction targets and sustained demand for REDD+ credits. Carefully regulated and supervised markets need to have arrangements in place to avoid market flooding and high price volatility. Safeguards and compliance checks at the implementation level need to ensure the adherence to social and environmental safeguards that guarantees that the social benefits of REDD+ reach local stakeholders and that biodiversity is protected. It is also beyond question that public finance has to compliment REDD+ markets and support broader governance and regulatory reform in developing countries.

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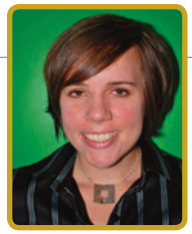

Integrating Project and National REDD+: The Importance of the Private Sector

Abstract

Despite the emphasis on moving to scale and focusing on national-scale accounting and crediting for REDD+, there remains a critical need to maintain private-sector investment in project activities and supporting mechanisms. This is needed to ensure adequate financing, as well as the ongoing effectiveness of programs, including real emissions reductions, and the protection of forest resources. The integration of project-level activities in sub-national and national frameworks—not only at 'start up', but also in ongoing REDD+ activities—will help maintain private-sector investment and ensure viable, sustainable emissions reductions and removals over the long-term.

I. Introduction

Policy discussions surrounding Reduced Emissions from Deforestation and Forest Degradation (REDD) have focused primarily on national accounting and on crediting the frameworks and national policy reforms that are required to address deforestation from the top down. At the same time, various on-the-ground efforts are being implemented in dozens of countries, demonstrating how REDD+ activities can develop workable solutions to address the underlying causes of deforestation and forest degradation, leverage private-sector capital, engage local actors, and spur action quickly. These top-down and bottom-up activities must at some point meet in the middle in order to ensure effective REDD+ implementation, including sufficient investment to fund the vast number of interventions that will be necessary to achieve our REDD+ objectives.

The private sector[1] is a key actor in virtually all on-the-ground REDD+ activities, and it offers much more than just interim financing or pilot activities. This paper will argue that on-going private-sector engagement is absolutely essential, not only to finance REDD+ programs over the long-term, as is well established, but also to support and undertake activities that effectively address the drivers of deforestation on the ground. Regardless of the ultimate legal status of REDD+ 'projects', bottom-up, project-level activities will logically be required to address the drivers of deforestation and degradation effectively because the economic drivers for deforestation can only be clearly identified and addressed on the ground. And importantly, bottom-up project activities will have to work in conjunction with top-down policy changes as countries move towards national-scale activities and frameworks.

ODA is notoriously fickle, which means there is a high risk that funding will run out when the world's attention shifts to other issues.

The way forward for capturing the benefits of on-the-ground activities is clearly to ensure a pathway for existing private-sector REDD+ projects to scale up and 'dock into' emerging national frameworks. Ensuring such a pathway for private-sector and civil society-led projects will ensure that the most experienced and effective practitioners are not pushed out of the REDD+ effort just as activities are ramping up. It will also give private-sector investors a port at which to dock into the REDD+ effort by providing the opportunity to invest capital at the project level, and to do so with acceptable levels of risk. Drawing in private investment is critical for a host of reasons that will be described in detail in this paper.

The first and most obvious reason that private-sector involvement is needed is that Official Development Assistance (ODA) and other types of government-led climate fund will not be sufficient to cover the scale of financing needed for effective REDD+ implementation. ODA is notoriously fickle, which means there is a high risk that funding will run out when, eventually, the world's attention shifts to other issues. Indeed, even with proceeds from the sale of GHG credits, international support at the level pledged today will not be sufficient to fund ongoing REDD+ implementation sustainably at the national level.

We argue that, ultimately, the most effective frameworks for REDD+ implementation will integrate project-level activities into sub-national and national accounting and crediting frameworks, allowing for direct private-sector financing and engagement. Indeed, we further argue that, in order to sustain REDD+ activities in the longer term, we must ensure from the outset that national and international policies are designed in ways that maintain private-sector involvement. And even at this early stage, it is clear that such policies will be most effective where bottom-up activities are recognized and accounted for in integrated REDD+ frameworks.

II. Bottom-up Activities and Private Investment Needed

2.1 Finance Needs: The Insufficiency of Public Funding

It is widely accepted that private-sector financing is required for forest protection because it is

1 For the purposes of this paper, the term 'private sector' is used to refer not only to profit-driven investors, but to the large variety of actors engaged in the development of bottom-up project-level activities (including NGOs and other civil-society actors), as well as those that may provide services to the market such as insurance providers.

clear that public sources of finance are now, and are likely to remain, insufficient. This remains true even if countries substantially augment current pledges. The Eliasch Review (2008) report, Financing Global Forests, states that approximately $18-26 billion a year will be required by 2020 to finance a 50% reduction in deforestation. Other estimates have come up with similar figures, in the range of US$12-35 billion per year (Meridian Institute, 2009; Boucher, 2008; European Commission, 2008; Busch et al., 2009).

Developed country governments pledged approximately US$ 4-5 billion per year from 2010-2012 to REDD+ efforts before and after last year's Copenhagen climate conference, although the final tally is difficult to verify given the fragmented and non-uniform nature of public announcements[2]. This amount is several times what has previously been pledged to REDD+ efforts, and yet it is still barely a third of the lowest estimates of need.

Compounding the problem, the unreliable, volatile and highly cyclical nature of official aid is well documented[3]. Aid rises and falls with economic conditions and political developments and is sensitive to the reality as well as the perception of global financial stability. Practical mechanisms to enforce the fulfillment of previous commitments effectively simply do not exist.

The 'finance problem' could not be more acute. Even when combining all pledged public funds with the maximum potential of the carbon market, additional public or private funds will be needed. The UK Office of Climate Change's Global Carbon Finance (GLOCAF) model, using the 2020 IIASA marginal abatement cost curve (MACC) commissioned for the Eliasch Review, predicted that the carbon markets could generate $7 billion in 2020. Combining that projection with current government pledges barely approaches the very lowest estimates of needs. While a discussion of possible avenues for obtaining additional funding is beyond the scope of this paper, historical precedent indicates that governments are highly unlikely to fill this funding gap themselves. As such, the private sector is the most likely source of any increase in funding for REDD+. This likelihood adds to the argument for private-sector involvement in REDD+ efforts, both initially and over the longer term.

2.2. Beyond Financing Needs: Public and Private Roles in REDD+ Efforts

Even if government financing were unlimited, throwing money at governments to create protected areas is, at best, marginally effective. Experience in forest protection over the past twenty years has shown that more complex strategies for management and incentives to protect forests are necessary[4]. When it comes to REDD efforts, a top-down approach will help create an enabling environment and catalyze further efforts, but it will not be sufficient to address fully the drivers of deforestation or offer alternative livelihoods in order to maintain forest protection over the longer term.

2 For more on finance commitment and needs, see Synthesis Report: REDD+ Financing and Activities Survey. 27 May 2010, http://www.regjeringen.no/upload/MD/sub/oslocfc2010/dokumenter/REDDpluss_surveySynthesisReport_final_100528.pdf.

3 The search for alternative ways of mobilizing capital for development and sustainability-related endeavors in developing countries extends far beyond REDD+ efforts. The unreliability of official aid has led many developing countries, for example, to shift toward capital-aggregating mechanisms such as sovereign wealth funds.

4 See, for example, 'Squandering Paradise: The Importance and Vulnerability of the World's Protected Areas,' C. Carey, N. Dudley, and S. Stolton, May 2000, http://assets.panda.org/downloads/squandering_paradise.pdf; "Conversion of Paper Parks to Effective Management: Developing a Target: Report to the WWF-World Bank Alliance from the IUCN/WWF Forest Innovation Project,' N. Dudley, and S. Stolton, 2000; 'Protected Areas Management Effectiveness Assessment for Central Africa: IUCN/WWF Forest Innovations Project', E. Hakizumwami, 2000.

Experiences with a wide variety of types of official government aid—whether for protected forest areas, health services, economic development, or other reasons—resonate with these lessons. Many scholars of economic development in particular argue that government aid should be used largely as a catalyst to help generate other sources of finance or develop the capacity to manage those sources, rather than to fund the primary development activity (Pronk et al., 2004). When it comes to REDD, the 'primary' activities are the immense efforts needed to address the specific drivers of deforestation in any given area. Private-sector practitioners working in the voluntary carbon market have been engaging in such bottom-up, primary efforts in recent years, developing the methods and creating the capacity needed to address deforestation drivers successfully through REDD+ projects.

At its highest level, a comprehensive REDD+ framework that provided for bottom-up and top-down activities in the ways outlined in this paper would resemble contemporary public–private partnerships. Such partnerships were born from the twin problems of insufficient funds and the lack of expertise and implementation capacity on the part of the public sector. Engaging in them implies a common understanding of shared goals and a willingness to redistribute responsibilities for the most efficient achievement of those goals, with the intention of harnessing the expertise of each partner. Given the extremely constrained availability of finance, capacity and expertise for REDD+ efforts, it is not just beneficial but imperative that the REDD+ policy framework be designed to allow each partner—the public and private sectors—to do what they do best.

A simple breakdown of REDD+ costs, as used in several studies, shows that there is a relatively natural dichotomy between public- and private-sector roles in REDD+ efforts. Eliasch et al. (2008), for example, differentiate among various costs: 'up-front capacity building', or the development of governance and of measuring and monitoring capacity; 'forest protection', or the adoption and implementation of forest emissions reduction policies; and 'opportunity costs', or payments made for avoiding deforestation. The first two activities lie squarely in the realm of the public sector, although the private sector can certainly assist governments in building capacity at various levels and in determining effective policies. Determining which actor is best suited to carry out the third activity, however—making payments for avoiding deforestation on the ground—requires further reflection on exactly what types of activities these payments will fund on the ground.

2.3 Avoiding Deforestation from the Bottom Up

If 'payments made for avoiding deforestation' consisted simply of paying known landowners the equivalent of the opportunity costs incurred for keeping trees standing, then the task would be relatively straightforward. In reality, however, halting deforestation requires much more than passing out cheques: it requires developing and implementing complex strategies tailored to the specific economic drivers of deforestation in any given area. Effective strategies will require working to reduce demand-side pressures with regard to a range of goods and services and reduce the destruction of marginal land for agricultural and other livelihood purposes. The intention is nothing less than encouraging permanent changes in deeply ingrained and, at times, highly profitable land-use behaviour among a variety of actors.

In some cases it will require working closely with very large private-sector interests, such as multi-national timber companies, to reconsider sourcing practices and possibly mitigate demand-side pressures. This work is likely to be contentious and complicated,

requiring appropriate technical and business expertise in order to develop viable solutions from the perspectives of both the company and the forest. Private-sector REDD practitioners, with support from governments, are likely to be the best choice if this minefield is to be negotiated successfully.

At the other end of the spectrum, REDD strategies will also require working closely with small landowners and marginalized communities to develop alternative livelihoods, teach agricultural intensification practices and encourage fuel-wood savings, among other things. Such activities could include the organization of training programs for alternative livelihoods, such as harvesting non-timber forest products; the implementation of strategies to improve yields on existing agricultural land; and the introduction of improved cook stoves to save fuel wood (and improve indoor air quality in many cases). It will also require building the capacity of such communities to engage in project development and operation. Such capacity-building could consist of working with communities to strengthen tenurial authority through mapping and boundary demarcation; to develop relationships with commune, district and provincial representatives; to organize community patrols to monitor illegal logging; to develop fire control strategies; and to develop annual carbon stock monitoring systems[5].

As with the provision of micro-finance, in which largely private entities provide very small loans to many low- or no-income clients, small-scale REDD activities are labour-intensive and thus require many practitioners on the ground who are ready and able to deploy innovative strategies with agility. Such a role undoubtedly provides a better fit for private entities than for governments. Indeed, as they implement specific REDD+ strategies, private practitioners will also develop further expertise that is crucial for continual improvement in REDD+ performance and the expansion of REDD+ activities to areas facing stronger pressures to deforest. In this way, project activities on the ground act now and will continue to act as the tool for scaling up and the building blocks upon which national and international efforts can be constructed.

When it comes to REDD efforts, a top-down approach will help create an enabling environment and catalyze further efforts, but it will not be sufficient to address fully the drivers of deforestation or offer alternative livelihoods in order to maintain forest protection over the longer term.

Some might argue that the public sector could take on the role of developing and implementing bottom-up approaches to address deforestation drivers such as those described above. Doing so, however, would disregard the lessons that led to the development of successful contemporary public-private partnerships. Private actors have the experience, available capacity and agility to develop and undertake project-level REDD strategies; governments generally do not. Governments have the ability to put in place the infrastructure and policies that create an enabling environment for their success; private practitioners and investors do not. A comprehensive REDD+ framework should embed this natural dichotomy by putting in place rules that incentivize private-sector participation in REDD+ efforts from the bottom up, thereby freeing the public sector to focus on getting the top-down activities right.

5 For a real-world example of the activities that REDD projects engage in, see 'Designing Collaborative REDD Projects: A Case Study From Oddar Meanchey Province, Cambodia,' Mark Poffenberger, Ph.D, Steven S. De Gryze, Ph.D, and Leslie L. Durschinger, http://www.communityforestryinternational.org/publications/research_reports/REDD-Final.pdf.

2.4 Bringing the Private Sector On Board, and Keeping it there

Recognizing that private-sector involvement is critical to ensuring the success of REDD+ efforts is an important first step, but we must go further to guarantee the initial and continued participation of private-sector actors. To guarantee private-sector involvement, we need a clear understanding of what will encourage private practitioners to remain involved in REDD+ and to convince private investors to provide much-needed finance. This requires taking a close look at the risks facing the private sector in the context of a potential REDD+ crediting mechanism.

A comprehensive REDD+ framework should embed this natural dichotomy by putting in place rules that incentivize private-sector participation in REDD+ efforts from the bottom up, thereby freeing the public sector to focus on getting the top-down activities right.

Any REDD+ crediting mechanism promises to be dauntingly complex given the scale of the challenge of deforestation and degradation, the many levels at which REDD+ activities must be undertaken and the variety of actors, governmental and non-governmental, who will be involved. Engaging with such a mechanism will be uncharted territory for private-sector actors, entailing significant risks for the investment of private capital.

Private-sector actors will face various levels of risk. In general, they will face a high level of sovereign risk, or the political risk that stems from the need to engage with and, in most cases, rely on the abilities of a sovereign government for direction and enforcement. Sovereign risk is exacerbated in the case of REDD+ activities given the complexity of the challenge, which requires a much higher level of involvement by developing country governments than was required in previous offset mechanisms, such as the Kyoto Protocol's Clean Development Mechanism (CDM). The respective government must play a leading role in establishing the domestic action plan, in devising, implementing and enforcing the top-down policies to create an enabling environment and in agreeing a national or sub-national crediting baseline with the international regulatory body that will credit REDD+ activities.

Given the fact that government must play a leading role, depending upon system design, any of the following delivery risks may apply:

- **Implementation Risk:** the risk that the government fails to establish an appropriate regulatory framework or to enforce established laws adequately for reasons of insufficient capacity or negligence. This creates an environment that works against private-sector practitioners, undermining their ability to perform and generate credits.
- **Default risk:** the risk that the government fails to honour agreements made regarding crediting with private-sector entities where crediting is directed through governments, rather than directly to projects.
- **Performance risk:** the risk that the top-down strategies developed by the government fail to meet the performance objectives set by the system, despite being fully implemented and well enforced. In this case, the delivery of credits to well-performing projects may not be proportional to their individual performance or might be withheld entirely.

All of these constitute versions of delivery risk, which stems from the increase in sovereign risk.

Private-sector actors will need to evaluate these risks for every national or subnational program established. They will know that options for the enforcement of a sovereign-to-private entity contract are minimal, which will further increase their perception of risk. Some increase in sovereign risk cannot be avoided given the complexity of the REDD+ challenge, but it must be acknowledged and mitigated through REDD+ system design if private actors are to be encouraged to participate.

How can REDD+ system design effectively mitigate the risks perceived by private-sector actors? First and foremost, the system must provide the greatest possible regulatory certainty over the lifetime of the activity or throughout its pre-determined crediting period. The international regulatory body[6] and, indeed, the REDD+ crediting mechanism itself must have sufficient stability to allow the project to complete its crediting period(s) and/or to allow the investment to reach maturity. Uncertainties about the institutional security of the CDM after the expiry of the Kyoto Protocol's first commitment period have caused great anxiety among private-sector participants in the CDM and mean that subsequent mechanisms must pay even greater attention to ensuring institutional longevity ex-ante in order to draw in private-sector participation (UNFCCC, 2010).

Secondly, the system must offer private actors assurance that their investment will remain viable through the stages of phasing in a REDD+ program, particularly when crediting moves from being solely project-based to the subnational and national levels. Several proposals for the establishment of a REDD+ crediting mechanism, including those discussed to date in the US Senate, include a very limited term of direct project-based crediting and then allow, but do not ensure, so-called 'nested crediting' for private sector-led project activities if the domestic government allows. To be clear, these proposals include the possibility of nested crediting without any assurance that host countries will agree to it and without further clarifying how the rules of a transition from solely project-based to nested crediting may be set or what they will be. Provision for nested crediting is a step in the right direction, but simply including the possibility of nested crediting is not enough to spur private investment on a large scale. The system must provide a clear path to nesting from the onset of the program, including agreement by the host country that pre-existing projects will be nested within the new system and the application of the rules of crediting to nested projects. It must insure against retroactive decision-making that impacts on investments that have already been made.

Thirdly, when designing the REDD+ mechanism, policy-makers should strongly consider including a provision that guarantees direct crediting from the international regulatory body for nested project activities. Giving the authority to issue credits for projects to an international body greatly reduces the sovereign risk to investment, maximizes investor security and should therefore encourage greater private-sector participation. There is no room here to discuss even the most basic ideas, but there are many options for how the rules for direct crediting could be written so as to maintain the integrity of a national or subnational crediting baseline (The Nature Conservancy and Baker and McKenzie LLP, 2010). For example, even if a pre-established, project-specific baseline was the basis for crediting, arrangements could be made to include a percentage of 'at risk' credits in the private-sector accounting. These credits would be held back until the na-

6 Such a regulatory body could be similar to the CDM Executive Board, with largely centralized control of registration, approval and crediting under the mechanism. It could also have a more decentralized regulatory structure consisting of dual authorities, with a Board at the UNFCCC level for relatively high-level approvals and a regulatory body in the host country for the monitoring and enforcement of more discrete program requirements.

tional or state/provincial baseline was achieved, thus allowing both public and private actors to share some level of risk in achieving the national- or state/provincial-level baseline.

The key for attracting private-sector investment, however, is ensuring that the risks to investment and participation are clearly identifiable and calculable at the beginning of the program. Further, accounting for the loss of the at-risk investment must not render the investment commercially unviable, so the percentage of at-risk credits must be relatively limited[7]. If all or a majority of the credits are 'at risk', as in the situation where the crediting of a project is wholly dependent upon the achievement of a national or state/provincial baseline, the risk will be incalculable and the accounting implications will be great. Very few if any investors will participate.

If crediting does not flow directly to project-level activities from the international regulatory body but rather through the domestic government and then to private-project practitioners and investors, this may still be attractive to private-sector investment. The attractiveness of investing will depend largely upon the governance capacity and extent of rule of law in the country in question. Also, domestic policy and accounting frameworks must ensure the fair distribution of credits by assigning clear carbon rights to the actors involved and allowing them to enter freely into legal purchase agreements with other private-sector credit buyers. Doing so will partly address counter-party risk by ensuring that the private sector has a buyer/seller relationship with other private actors to which it has legal recourse.

7 Necessary limits will depend on the country (sovereign risk) and the difficulties of REDD project implementation for the land area in question.

III. Knitting It All Together: Frameworks for Integration

In order to address risks and incentivize private-sector involvement sufficiently, the design of the REDD+ mechanism must 'knit it all together', including existing project-level activities, as well as jurisdictional (national and subnational) activities and national accounting and crediting systems. At this time of uncertainty in terms of the future of international and US climate policy, activities at the project and jurisdiction levels are still advancing, and any eventual international mechanism for REDD+ will have to take these activities into account. If we fail to create workable frameworks, even at this early stage, we risk ending up with a plethora of different approaches at different levels that result in irreconcilable accounting issues and missed opportunities for capturing synergies

3.1 Options for Integrated Framworks

There are numerous ways in which an integrated REDD+ framework may be structured, and this article does not attempt to outline all of the various technical and political issues, but rather highlights the potential high-level options that will affect private-sector investment and address deforestation and degradation. The choice of an appropriate framework will be determined by local factors and priorities, and no single framework will fit all circumstances. The one characteristic that all integrated frameworks share is that they allow crediting at different levels, whether this is done directly by an international regulatory body or via host governments.

In order to achieve crediting at multiple levels, any integrated framework will need to account for project and jurisdictional level (e.g. at the municipality, state/province and national levels) activities

against a national reference level. In addition, non-overlapping reference levels for distinct regions/jurisdictions will need to be delineated so that together they add up to the national reference level. Project activities would use the appropriate baseline for their areas as defined under the overarching reference level for the entire region/jurisdiction, thus streamlining the necessary project accounting, as well ensuring that emissions reductions add up across the different scales. Setting such reference levels will require political negotiation and compromises and will face a number of challenges, but it will ultimately result in more workable frameworks for activities at all levels.

Beyond the setting of reference levels, the form of integrated accounting and crediting will have to be determined by the government to account for country preferences and circumstances. As recent reports have outlined (O'Sullivan et al. 2010), there are a number of variations possible for integrated REDD accounting and crediting, for example:

1) **National-level crediting,** where an international regulatory body directly credits only the national government. Accounting and MRV systems would be adopted at the national level, with project activities approved by the national government. All credits would flow directly to the national government, which would determine how credits are shared and would directly distribute credits amongst jurisdictions or projects, where any credits issued to jurisdictions and project activities would be deducted from national accounts. The risk of underperformance may be managed by buffer pools or insurance mechanisms, as is further outlined in section 3.3. This option places the greatest demands on national governments, requiring high capacity, good governance and strong institutions to ensure transparent and effective implementation. Though potentially the least controversial option, it may be difficult to implement for key REDD+ countries, many of which have political instability, weak institutions and capacity, and poor enforcement mechanisms. Private-sector investors may hesitate to become involved due to high counter-party risk, as outlined in section 2.4.

2) **National and project crediting,** where an international regulatory body directly credits both national and project activities. Accounting and reference levels would be adopted at the national level, but project activities (which would still be approved at the national level) may be independently monitored and verified. Credits would flow both to national governments and directly to sub-national activities, including directly to projects, as well as to sub-national jurisdictions, ensuring that project and sub-national jurisdictional issuances are subtracted from national accounts to prevent over-issuance or double counting. This option requires careful design so that credits issued to projects, to other sub-national activities and to the national level add up, and that the risk of under-performance by projects or countries is adequately addressed. This option also places demands on national governments and requires strong institutions, but it is the most attractive option for the private sector, as it would allow direct buyer/seller relationships where projects are credited directly.

The choice of an appropriate framework will be determined by local factors and priorities, and no single framework will fit all circumstances.

3) **Sub-national and project crediting**. There may also be a period of time between the current dominance of project-focused and purely voluntary REDD+ markets and the establishment of an international mechanism for REDD+, where accounting and crediting could be done directly at the sub-national jurisdictional scale, without a national framework having to be in place. This would resemble either option one, where a jurisdiction may be credited directly and the jurisdiction would determine how credits are distributed to project activities; or option two, where projects and jurisdictions are directly credited against a jurisdictional reference level. This option could potentially cover the gap between current bottom-up project activities and the day when systems, and an international agreement, are in place for national-scale activities, as well as serve as a testing ground for the development of credible integrated frameworks that could be adapted to, and adopted by, national governments.

Table 1 shows a comparison of three potential options. Options one and two require strong national institutions. In the long term option two (option three potentially, where projects may be credited directly) is the most attractive for the private sector because sovereign risk for investors is lowest, as it does not rely on the national government to manage domestic credit issuance or benefit sharing. Although institutional requirements are still high, such a framework would place a lower burden on national governments, as proj-

Table 1. *REDD+ Crediting and Accounting Options*

	To whom are credits issued?	How would projects receive credits or benefits?	Accounting & MRV
Option 1	National governments	National governments would determine domestic credit issuance and/or benefit sharing	National accounting and MRV
Option 2	National governments and project activities	Standalone project activities may be credited directly from an international body. Such credits would be deducted from national accounts, to ensure no double issuance of credits	• Project and national accounting and MRV • Mechanisms to ensure crediting at different scales 'add_up' are required
Option 3	3a) Subnational programs (governments)	3a) Subnational governments would determine credit issuance and/or benefit sharing to projects within the jurisdiction	• Project and subnational (jurisdictional) accounting and MRV
	3b) Subnational programs (governments) and project activities	3b) Standalone project activities may be credited directly from an international body. Such credits would be deducted from jurisdictional accounts, to ensure no double issuance of credits	• Mechanisms to ensure crediting at different scales 'add-up' required

ect activities could be developed, monitored and verified by independent third parties.

This is not to say that private-sector engagement and bottom-up activities are not possible under option one. Whether projects and jurisdictions are eligible for direct crediting, or whether credits are dispersed by the national government, what is essential is that there is a pathway for project activities to be credited for emissions reductions achieved.

3.2 Case Study

Even within a fully integrated REDD+ framework at the national level, there will be differences between countries. Below is just one example from Indonesia that shows the different options both between and within different countries.

In addition to readiness activities at the national level, Indonesia is currently developing a number of different strategies at the provincial and district levels, as well as a number of project activities. It is difficult to identify the exact number or extent of current project-level activities, but there are at least twenty distinct voluntary projects under development across Indonesia[8]. These activities represent the most advanced on-the-ground development of REDD in Indonesia, providing valuable insights into the structure of effective REDD+ activities, and building capacity for local communities, governments and non-governmental actors. It would be a mistake to disincentivize or discourage the continuation of such activities that have pioneered the REDD markets.

Much like the decentralization of the management of forest resources, which Indonesia transferred to regional governments in the late 1990s, an integrated REDD framework in Indonesia may engender a decentralized system in which provinces determine how projects are nested within jurisdictional programs, while supporting policies and programs are developed at the national level, including systems to ensure that jurisdictional and national emissions reductions are properly reconciled.

Current funding to the national government and REDD readiness activities include funding under the World Bank Forest Carbon Partnership Facility (FCPF), the UN-REDD Programme (with funding of USD 5.6 million for 2009-2011) and directly from the government of Norway (up to USD 1 billion over 7-8 years)[9]. These activities primarily focus on assisting the Government of Indonesia in attaining REDD readiness, including the establishment of a national reference level, MRV systems, benefit-sharing and stakeholder engagement mechanisms and capacity building, as well as some pilot/demonstration activities. The UN-REDD Programme funding also aims to develop capacity at decentralized levels, one example being the capacity for spatial socio-economic planning, including REDD, at the district level, as well as district plans for REDD implementation.

These top-down developments fit nicely with the 'natural dichotomy' between public and private

8 UN-REDD Program (2009). Indonesia. Available at www.un-redd.org/UNREDDProgramme/.../Indonesia/.../Default.aspx

9 See UN-REDD Program (2009). Indonesia UN-REDD National Joint Programme. http://www.unredd.net/index.php?option=com_docman&task=doc_download&gid=263&Itemid=53, FCPF (2010) Summary of Indonesia REDD Readiness Activities Financed through FCPF Programme. http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Jul2010/Website_FCPF_Definition_of_activities_FINAL25Juni2010.pdf, and Royal Norwegian Government (2010) Norway-Indonesia REDD+ Partnership. http://www.norway.or.id/Norway_in_Indonesia/Environment/-FAQ-Norway-Indonesia-REDD-Partnership-/

roles in REDD+ efforts discussed above. REDD readiness activities are focused on the up-front capacity-building and establishment of support policies for forest protection. However, they are not primarily focused, despite some funding for pilot/demonstration activities, on addressing the site-specific drivers of deforestation and degradation, the development of alternative livelihoods or the implementation of other activities necessary to prevent deforestation which are being addressed (at a local level) by the project activities that are currently under development. At the jurisdictional level (province, district, municipality), REDD implementation plans and current activities vary, as demonstrated by the examples of West Kalimantan and the Berau District in East Kalimantan.

West Kalimantan Province on the island of Borneo has promoted a number of pilot projects, most of which have been developed under voluntary market standards, including the Voluntary Carbon Standard (VCS), with the aim of moving to an integrated framework post-2012 that will encourage private-sector investment. Current government interventions focus on setting a provincial reference level and developing MRV systems, stakeholder consultations and promoting the development of REDD+ projects for integration within provincial and national frameworks[10]. Most current project activities are being developed under the VCS, which is often combined with the Climate, Community and Biodiversity (CCB) Standard to cover the social and environmental co-benefits of such projects. The VCS provides a robust platform for the development of project activities, including addressing leakage and permanence. An effective integrated framework will include and allow crediting to such project activities, which are currently proving that such site-scale interventions can address drivers of deforestation, build local capacity and maintain private investment, and can do so in a credible manner that addresses concerns over leakage and permanence.

Berau District in East Kalimantan, however, is taking a top-down jurisdictional approach. The Berau Forest Carbon Program, which is a partnership between The Nature Conservancy and national, provincial and district governments together with civil-society and private-sector interests, is developing the entire district as a single REDD+ program within a top-down managed framework. The program includes site-level direct interventions such as improving the management of protected areas and logging practices, in addition to institutional developments to create a jurisdictional measurement and accounting framework. Such sub-national activities could be credited either directly from international carbon markets (option 2), or via the national government (option 1), and this decision will vary by country and potentially by jurisdiction. Creating a policy environment and designing a REDD mechanism that encourages activities at these different levels will ultimately be more effective, as drivers of deforestation can be addressed at an appropriate level, whether project, jurisdictional or national, and will facilitate the continuation of private-sector investment.

Many other jurisdictions, for example, in Peru, Mexico, Brazil, Colombia and elsewhere, are developing strategies and frameworks for REDD+ activities at the state, regional and district levels, in addition to national-level REDD+ readiness activities. In some countries like Guyana, national frameworks will be much more centralized and top-down, rather than encouraging or allowing different state/province-level frameworks or promoting project ac-

10 West Kalimantan Province presentation at Governor's Climate and Forest Task Force (GCF) meeting (APR 2010).

tivities. Ultimately it will be up to national and state/province governments to determine the framework most appropriate in their countries through the political process.

However, such national programs will take time to develop, and sub-national frameworks may in some cases be developed in advance of, or somewhat independently from, those at the national level. It will clearly be important for such programs to be harmonized at the national level, and developing integrated frameworks as soon as possible will help to avoid the risk of ending up with a patchwork of different approaches and conflicting accounting systems that may later be impossible to integrate. Developing integrated frameworks at this early stage is the best way to ensure that early action, pilot activities, ongoing projects and jurisdictional programs can later dock into national accounting frameworks being developed top-down.

3.3 Key issues

As we move up the scale from project to jurisdictional to national accounting and crediting, many of the risks associated with project-level activities are addressed. In particular, permanence and leakage become less problematic when national inventories can be used to account for all changes in forest cover at the national level. Maintaining project activities within these frameworks will help to maintain investment and address local drivers of deforestation, but allowing crediting directly to projects and other sub-national activities does raise a number of other issues that must be addressed to ensure environmental integrity.

A well-designed system will need to address a number of issues, including:

- **Measurement**, monitoring and verification of emissions reductions at all levels, including project (where applicable), jurisdictional and national levels. This will require integration of MRV results at all levels in a transparent system. Accounting for reductions at multiple levels will ensure that sub-national activities do not 'add up' to greater reductions than those realized nationally. A mechanism for resolving potential inconsistencies between project and jurisdictional claims is needed to ensure there is no double counting.
- **Determination of the number of credits to be issued and the ownership of such credits.** This is likely to vary based on whether crediting is allowed sub-nationally or only via the national government. It also requires appropriate legal frameworks for carbon and credit ownership.
- **Risk assessment and mitigation**, for example, the creation of risk-management systems to address potential underperformance or reversals, and including different options to address project and jurisdictional risk management. Options to manage liabilities and risks may include the creation of reserve accounts, where projects and jurisdictions would deposit a percentage of credits to be used in the event of underperformance, insurance or other mechanisms.
- **Addressing project-level and regional leakage.** This may include some sort of 'leakage tax' paid by projects, additional buffer withholdings, or other systems. Where both projects and jurisdictions are credited, jurisdictions should not be fully responsible for any leakage from project activities that result outside the project boundary. While leakage may 'disappear' to some extent when projects are integrated into jurisdictional and national accounting, there must still be a mechanism to

distribute credits fairly among projects and jurisdictions to account for the possibility that some deforestation may shift elsewhere in the jurisdiction when project activities are implemented. Leakage may also remain between jurisdictions, and this must be addressed by national accounting.

Ultimately, the structure of an appropriate REDD+ mechanism must be designed to ensure the most efficient and effective means to address the drivers of deforestation and degradation, as well as to ensure a transparent and fair means to distribute credits among those responsible for emissions reductions. An integrated system will be most effective in doing this by ensuring that activities to reduce emissions at multiple levels can be directly rewarded. The limited public funding available should be directed at the key policy issues that need to be resolved, including the mechanisms to allow a functioning integrated REDD+ framework that are effectively managed at the national level, while jurisdictions (states, provinces, regions) implement local activities and programs and allow project-level activities where appropriate.

The voluntary markets (see box 1) may serve as a model for how bottom-up activities nest within jurisdictional accounting and crediting frameworks, providing a testing ground to ensure that projects being developed now will be able to dock into jurisdictional and eventually national frameworks in the future. This would also unlock some of the funding gap between REDD+ readiness funding being supplied today and the day when private finance (through compliance carbon markets) is flowing.

Box 1. *Voluntary Market developments*

According to the State of the Forest Carbon Markets 2009 report (Hamilton et al. 2010), 5.3 million tonnes (5.3 MtCO2) totalling USD 37.1 million were transacted in the forest carbon market in 2008, of which only 0.2 MtCO2 were transacted in regulated markets. And historically, 75% of forest carbon transactions have been in the OTC voluntary carbon markets.

The VCS was the first large-scale GHG program that included project activities from the agriculture, forestry and other land-use (AFOLU) sectors in a way that made credits from these activities fungible with credits from other, more traditional sectors (e.g., landfill gas, renewable energy). The VCS achieved this through a comprehensive two-year stakeholder and public consultation process, drawing on leading forest and agricultural carbon experts and practitioners, including from CATIE, Winrock International, The Nature Conservancy, Conservation International, the Nicholas Institute at Duke University, CO and OH State Universities, the Chinese Academy of Forestry, the Swiss Federal Institute of Technology, Joanneum Research, TÜV SÜD and others. This work resulted in the requirement that projects facing the risk of non-permanence set aside a certain percentage of the credits they generate in a pooled buffer account that then serves as insurance against potential future losses. This work also resulted in robust approaches for addressing leakage. Both of these approaches, which the VCSA continues to refine and update as new technical and scientific information is published, have played an important role in helping to lend legitimacy to AFOLU project activities and in encouraging further investment in such efforts.

Further developments in the voluntary markets, such as the possibility to credit jurisdictional (national, state, municipality) emissions reductions under standards such as the VCS, could promote critical developments for the integration of project activities into state and national accounting frameworks.

IV. Conclusions

In order to stop, or even halve, global deforestation, we must address the causes and not just the symptoms of deforestation. While the drivers of deforestation differ in kind around the world, they are all fundamentally linked to economic activity. Whether the main driver is the production of commodities (timber and agricultural commodities) for export or subsistence-level consumption of resources by forest communities, shifting the dynamic requires nothing less than the re-alignment of economic incentives for local communities, regions and countries. Unless we address the economic drivers of deforestation at the various levels, it will not be possible to halt deforestation. Engaging the private sector does not mean engaging only private-sector REDD+ project developers, investors, or insurance providers: private-sector involvement goes way beyond that. It also means engaging local communities, local governments and companies undertaking activities that result in deforestation.

By directing private-sector investment into spatially well-defined project interventions, we ensure that robust and credible MRV of such reductions is possible. National policies and programs will provide the legal and policy frameworks and may directly reduce deforestation and degradation, but in many cases it will not be possible to attribute any reduction from these activities to a particular area that can be monitored and verified. Therefore, establishing credible mechanisms to credit project-level activities directly is not only more attractive to the private sector, it is ultimately more robust.

No entity is more effective than national governments at creating enabling policy environments for broad national policies. However, governments have proved less effective at implementing the myriad site-scale interventions that are necessary to address the underlying drivers of deforestation, livelihood issues and community engagement. In addition, major gains have been made around the world in the last few decades to devolve rights to forest resources to local communities. Separating rights to carbon from rights to forest resources risks cutting local communities off from the benefits they deserve for protecting their resources.

In order to stop, or even halve, global deforestation, we must address the causes and not just the symptoms of deforestation. While the drivers of deforestation differ in kind around the world, they are all fundamentally linked to economic activity.

Effective REDD+ implementation will require the interaction of a huge number of stakeholders, who will likely be at odds and must be brought together. Ensuring effective frameworks for actors at different levels to participate should create clear pathways for participation and therefore greater commitment. Such systems should be structured strategically and with stakeholder input in order to be effective. By allowing crediting directly to project- and jurisdictional-level activities, those who are closest to the resources and drivers of deforestation can be engaged and rewarded, thus incentivizing participation, maintaining rights to resources and, where projects are well designed, ultimately ensuring the sustainable alternative livelihoods that are necessary for the ongoing protection of forest resources.

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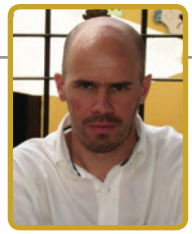



The 'Nested Approach' to REDD+: How Could it Be Implemented?

Abstract

The 'Nested Approach' is a framework for structuring effective incentive mechanisms for reducing GHG emissions from deforestation and forest degradation at multiple scales. The approach is designed to encourage immediate emission reductions in developing countries at a scale compatible with their capacities and levels of governance. Subnational and national mitigation activities are both eligible for international performance-based incentives, and a negotiated but limited time has been granted to governments for moving from sub-national to national implementation. The proposed framework creates the conditions needed for early involvement of the private sector in mitigation initiatives, which is essential to complement public efforts and achieve meaningful emission reductions to keep the global average temperature increase below 2ºC in this century.

1. Introduction

One of the main issues being discussed within the context of the ongoing negotiations on an international mechanism for Reducing Emissions from Deforestation and Forest Degradation, conserving and enhancing carbon stocks and sustainable forest management (REDD+) under the United Nations Framework Convention on Climate Change (UNFCCC) relates to the 'scale' of initiatives to be incentivized by such a mechanism.

Many Parties to the Convention have proposed that only emission reductions achieved at the national level should be incentivized, arguing that only a country-wide accounting of emissions could ensure that emissions caused by leakage from specific initiatives carried out within the country would be accounted for, and due to the political need to demonstrate meaningful, large-scale participation

1 The authors would like to thank the valuable contributions and suggestions received on earlier drafts from: Toby-Jason Smith, Steven Panfil, Charlotte Streck, Robert O´Sullivan, Jacob Olander, and Donna Lee.

by developing countries in global mitigation efforts in the post-2012 period. National approaches would be led by national governments, and the international incentives generated through the REDD+ mechanism would be granted to them if country emissions are reduced compared to a historical reference level during a determined period (e.g. a commitment period). Governments would be in charge of managing such incentives to enhance their policies and measures or of distributing them among communities and individuals representing successful REDD+ initiatives.

Other countries have supported sub-national approaches, based on the concept of the Clean Development Mechanism and building on its national and international infrastructure. In this case, incentives would flow directly to successful projects and programs (e.g. through the issuance of carbon credits), and the role of the government would be limited to issuing letters of acceptance of such activities on the grounds of their sustainable development benefits.

A third approach, called the 'Nested Approach' (NA), was introduced in the UNFCCC negotiations by a group of observers,[2] and Latin American countries[3] as an alternative to an exclusively national approach. The idea was originally elaborated by Pedroni et al. (2009) and is further described in this paper. [4]

Today, the concept of 'nesting' sub-national mitigation activities in broader national frameworks is frequently mentioned in the discussions on REDD+ (e.g. Angelsen et al., 2008; Parker et al., 2009; Cortez et al., 2010; Estrada, 2010). Many stakeholders in the political process realize that developing-country governments are faced with REDD+ related demands and initiatives from sub-national governments, indigenous groups, civil society and the private sector, that national capacities and capabilities may take more time to be developed, and that public funding alone may not be sufficient to induce mitigation activities at the scale required to keep the global average temperature increase below 2 ºC in this century. There is a need to find effective approaches to incentivize public and private actors responsible for addressing the drivers of deforestation, to integrate sub-national REDD+ initiatives in national REDD+ frameworks and to leverage private investment in mitigation activities, whilst maintaining the overall environmental integrity of the system. In this paper, we aim to clarify how a 'Nested Approach' to REDD+ could achieve these objectives.

In essence, the NA enables immediate reductions of GHG emissions in developing countries at a scale compatible with their capabilities and levels of governance. It encourages improvements in forest governance by providing a negotiated but limited time frame for developing countries that are unable to achieve emissions reductions from deforestation and forest degradation at the national level in the near term to start acting through sub-national mitigation activities (projects and programs) and proceed over time to fully national (wall-to-wall) emission reduction schemes. Sub-national activities could encompass areas as large as entire biomes (such as the Legal Amazon in Brazil), individual states or provinces (political and administrative units), and smaller units of lands under specific projects, such as indigenous territories, protected areas, forest concessions, and private lands. In fact, sub-national

2 FCCC/SBSTA/2006/L.25: Submission to the UNFCCC by the Tropical Agricultural Research and Higher Education Center (CATIE) and the German Emissions Trading Association (BVEK) regarding Reducing Emissions from Deforestation in Developing Countries.

3 FCCC/SBSTA/2007/MISC.14: Submission of 'Paraguay on behalf of Honduras, Mexico, Panamá, Paraguay and Perú' and the submission of Chile.

4 I.e., a scheme through which international incentives would only be granted to developing-country governments for reducing national emissions compared to national reference emission levels, and which would not allow individual sub-national initiatives to access such international incentives.

efforts are supposed to scale-up over time from one such scale to a larger one, until they reach a point where a national scheme becomes feasible.

The NA requires sub-national and national mitigation activities to be implemented under consistent and credible frameworks for reference emission levels and monitoring, reporting, and verification (MRV). It is therefore based on a registry system that maintains separate carbon accounting records for each sub-national initiative carried out in a country, thus avoiding double counting of emission reductions where these are sold as offset credits to governments or private entities with legally binding emission reduction commitments. To prevent the creation of non-permanent emission reductions, the NA proposes an insurance mechanism that sets aside part of the emission reductions, which is kept as a reserve, or 'buffer', to compensate for any possible future deforestation that could undermine the environmental credibility of REDD+ credits.

Mobilizing private-sector investment is essential to reach the levels of finance required to cover the costs of REDD+, which may well be higher than the USD$ 5 to 15 billion per year estimated by Nicolas Stern (2006) and Johan Eliasch (2008)[5]. The accounting framework put forward by the NA guarantees developers of successful mitigation initiatives direct access to international incentives, regardless of the scale at which the initiatives may be implemented and the aggregate performance of all mitigation efforts of the host country vis-à-vis a national emission reference. This is done whilst maintaining overall environmental integrity, as explained later in this paper. By giving direct access to international incentives and delinking investment risk from national performance, two critical conditions are met for inducing the early engagement of the private sector in REDD+ efforts.

In addition, the flexibility and transparency of the NA may facilitate the recognition and incorporation of current REDD+ initiatives in future schemes regulated by the United Nations, and, as the case may be, in emission reduction schemes that certain countries and states could establish independently.

There is a need to find effective approaches to incentivize public and private actors responsible for addressing the drivers of deforestation, to integrate sub-national REDD+ initiatives in national REDD+ frameworks and to leverage private investment in mitigation activities, whilst maintaining the overall environmental integrity of the system.

The implicit goal of the NA is to promote the widest participation by countries and stakeholders from the outset, in order to achieve real, fast and significant emission reductions in a rational way, based on countries´ capacities, circumstances and development needs. This will ensure the permanence of carbon (and wider development) benefits, thus contributing to early, deep, and cost-effective climate-change mitigation.

2. Assumptions and conditions for implementing the NA

The NA assumes that Parties to the UNFCCC will adopt market-based approaches to incentivize

5 Stern estimated the opportunity costs of forest protection in eight countries responsible for 70% of emissions from land use to be around USD 5 billion per year. Eliash's review increased this estimate to about USD 15 billion per year. The costs of institutional capacity-building, MRV, enforcement, permanence and supplementarity, etc. are not included in these estimates.

REDD+ and that such approaches will be linked to developed countries' emission reduction commitments that are ambitious enough to generate demand for REDD+ carbon credits, ideally by following IPCC-recommended levels of global emission reductions to keep global warming within an acceptable range. It also assumes that developed countries will assist developing countries with technical and financial support, at least initially, to build the infrastructure required to run mitigation activities at the national scale.

In principle, the NA allows developing countries to start implementing their mitigation initiatives at either the sub-national or national levels, depending on their national circumstances

The NA may be adapted to an international system of performance-based incentives for REDD+ solely relying on public funds (e.g. Official Development Assistance). However, the scale of emission reductions that could be achieved by a system that does not mobilize private-sector investments at an early stage is likely to be lower than a system combining direct private-sector investment in mitigation activities and public investment in national 'readiness' [6] planning and implementation.

In principle, the NA allows developing countries to start implementing their mitigation initiatives at either the sub-national or national levels, depending on their national circumstances. In both cases incentives may be channeled directly to the promoters of successful initiatives. However, the approach might also be adapted through national arrangements in developing countries in case only national schemes would be allowed internationally.

Additionally, the following conditions will facilitate the implementation of the NA:

(i) ***Political will and leadership*** to encourage intra- and inter-sectoral dialogues on forest governance, enabling the design and implementation of policies, institutions, financing arrangements and management plans for the adoption of a national REDD+ implementation scheme in a defined time frame.

(ii) ***Transparent and expeditious procedures*** for the evaluation of sub-national REDD+ initiatives and their approval by the national government. Such procedures should be effective enough to exclude initiatives that do not meet national criteria of sustainable development.

(iii) ***A registry system*** of approved initiatives, reference emission levels, monitoring reports and carbon transactions, enabling transparent carbon accounting and avoiding the double counting of sub-national and national emission reductions. Such a system may be under national or international institutions.

(iv) ***Clearly defined rights of ownership of emission reductions*** under differing circumstances of use, possession, concession, administration, etc., of forested areas.

(v) ***Clarity and fairness on the definition of tributes, duties and royalties*** to be paid on

6 'Readiness' is a term coined in the context of the World Bank´s Forest Carbon Partnership Facility (FCPF) to indicate planning activities that developing country´s governments should consider to enhance national policies and institutions in getting 'ready' for implementing REDD+ at the national level.

REDD+ investments, credit transactions and benefit distributions.

(vi) ***A national monitoring system***, which may consist of sub-national monitoring systems properly organized and coordinated by a national entity, able to ensure consistency between reports from initiatives of varying scales and having the capacity to deliver timely, reliable, accurate and verifiable information to all REDD+ initiatives in the country, creating economies of scale in MRV.

3. Major differences of the NA with an exclusively national approach

The process of preparing and implementing REDD+ at the national level currently considered in the negotiations is viewed as falling into three phases: [7]

Phase 1: Development of action plans or national strategies, including the design of policies, measures and capacity-building ('readiness');
Phase 2: Implementation of national policies and measures;
Phase 3: Actions centered on results, which should be measured, reported and verified.

Consequently, a national approach would generate tradable emission reductions only in Phase 3, once all the required capacities have been built and the governance of the country has been strengthened. Under an exclusively national approach, successful sub-national initiatives would not be rewarded if emission reductions do not occur nationally, unless governments are willing to reward them with resources from their own budgets, which is unlikely to happen given the financial situation in developing countries. If national emission reductions are achieved, rewarding sub-national activities would depend on national benefit distribution policies. In both scenarios, public and private promoters of sub-national initiatives would have no control over the factors that determine the return on their investments, making it too risky for them to invest in REDD+. Under these circumstances, large guarantee funds need to be established to reduce risks and to motivate private and local government action, thus increasing the overall costs of REDD+.

With the NA, sub-national initiatives could generate emission reductions and earn credits even if the country as a whole does not achieve an overall reduction in emissions compared to a national reference emission level. In this way, the risk of investing in sub-national activities would not be linked to the performance of national governments, of their policies and programs, or of other projects over which promoters of sub-national initiatives have no control. This is an essential condition for the private sector to invest in REDD+ activities, and a reason why the NA could lead to greater levels of funding for REDD+, which in turn could accelerate the enhancement of capacities in developing countries and the achievement of more emission reductions globally in the near term. By not requiring the immediate existence of nation-wide MRV capacities and high governance levels, the NA would allow a greater number of countries to participate in REDD+ from the beginning, thus achieving early and larger reductions in emissions and diminishing the risk of international leakage.

7 See Meridian Institute (2009) and AWG-LCA, Non-paper No. 39, paragraph 7 (outcome of the AWG-LCA meeting in Barcelona, 2-6 November 2009).

The cost of reducing emissions at the national level is often too high[8] for developing countries to cover with their own budgets, particularly considering the many other pressing needs that such countries normally face. With an exclusively national approach, public budgets (including those of developed countries providing 'readiness' and implementation funds) would have to cover most if not all of the cost of REDD+, since there would be virtually no incentive for private investment. In contrast, with the NA, private actors could participate in covering such costs by investing in specific and independently rewarded activities, with identifiable counterparts and manageable risks. Additionally, this would incentivize local stakeholders and institutions with better knowledge of the local conditions and greater flexibility to adopt innovative solutions to improve local governance and increase efficiency in land use and forest management. Numerous national and international technical and financial stakeholders, with great capacities to generate innovative solutions, could actively seek to implement projects in areas where the presence of public institutions is weak and the threat of deforestation high, given the potential to generate emission reductions in these hotspots. In this scenario, governments could focus their programs on forests with lower pressure levels, where opportunity costs are lower, allowing them to cover larger areas with the same budget. Directing government incentives outside areas subject to sub-national initiatives could also have an important effect on reducing the risk of leakage that such activities could give rise to, thus achieving greater efficiency and effectiveness for all stakeholder interventions.

8 As an example, a recent study published by SERNANP (Armas et al., 2009) in Peru assessed the opportunity costs of reducing expected deforestation at somewhere between 54% and 88% in the next 10 years, i.e. between 127 and 170 million dollars annually. This estimate does not include the costs of institutional capacity-building, MRV or enforcement, among other costs that a country would have to cover to implement REDD+ at the national level.

The NA would also facilitate site-level tracking and reporting of the impact that REDD+ interventions would have on local stakeholders (including marginalized groups, such as indigenous peoples and forest-dependent communities), which could help build support for REDD+ from the development and pro-poor constituency. Similarly, the NA would enable conservation organizations to focus on, and be rewarded for, REDD+ interventions in specific regions of high biodiversity value[9].

4. How would the NA work in practice?

4.1 Level of participation

Developing countries would voluntarily decide their initial scope of participation in the REDD+ mechanism, according to their circumstances and national interests. In this way, a country could adopt a full national implementation regime early on, defining national reference levels and reduction targets for its forest emissions; or, if national circumstances require more time and resources to strengthen technical capacities, institutional frameworks, policies, etc., a country could begin to participate with sub-national REDD+ activities. A variant proposed in the literature (applicable to the NA) is the 'committed forests approach' (Forner et al., 2006), whereby a country initially commits only a certain percentage of its forests in defined areas where conditions exist to exercise control, later adding more areas, depending on the evolution of governance capacity.

4.2 Triggers for transition to a national scheme

If a country decides to participate by implementing sub-national REDD+ activities ini-

9 For instance, the widely used Climate, Community & Biodiversity Standards enable REDD+ project impacts on local communities and biodiversity to be independently assessed and reported.

tially, two 'triggers' would serve to motivate the country's public sector and to help it establish the infrastructure, capabilities and governmental conditions needed to adopt a national REDD+ scheme. As proposed by the NA, a country should adopt a national scheme when:

(i) the total area covered by sub-national REDD+ initiatives reaches a certain percentage of national forest land or, alternatively, when

(ii) an agreed number of years elapse from the date of registration of the first sub-national activity endorsed by the national government.

The level of both triggers – the percentage area (i) and the maximum number of years (ii) – would be proposed by each country and negotiated by the Parties to the UNFCCC. However, the countries that start with sub-national activities could voluntarily adopt a national scheme before reaching the threshold of the 'triggers'.

4.3 Recognition of sub-national initiatives in the long-term

When countries are ready to implement REDD+ at the national level, they must recognize the previously authorized sub-national initiatives and allow them to continue generating carbon credits throughout their crediting period (which could be 20 to 100 years, as in the VCS[10]). In this way, sub-national initiatives would be assured of reaching their investment horizons, which is critical if such initiatives are to be started in the first place.

10 The 'Voluntary Carbon Standard' (VCS) is a program of the voluntary carbon market that works like the Clean Development Mechanism (CDM).

4.4 National authorization

To achieve international recognition, sub-national REDD+ initiatives should be approved and registered by the national government in the first instance. In this way, there is assurance that the initiatives have been designed in accordance with the sustainable development priorities of the host country and its national REDD+ strategy. Therefore, the establishment of project evaluation criteria and transparent and expedient procedures for national authorization are important steps in the process.

"When countries are ready to implement REDD+ at the national level, they must recognize the previously authorized sub-national initiatives and allow them to continue generating carbon credits throughout their crediting period"

4.5 Carbon Credits

Carbon credits for emission reductions generated sub-nationally would be issued directly to participants of the registered sub-national initiatives by a specialized body of the UNFCCC[11], following methodologies, procedures and rules agreed upon by the Parties of the REDD+ mechanism. Sub-

11 While this section of the paper talks about potential UNFCCC pathways for operationalizing the NA, it should also be recognized that the House and Senate climate bills currently under consideration in the U.S. provide a clear pathway for supporting sub-national initiatives, spelling out how project- and state-level activities could be directly credited on their own and under national accounting frameworks. Furthermore, the Waxman-Markey and Kerry-Boxer bills would both allow developing countries to participate in sub-national REDD+ activities for a maximum period of 8 years, a proposal highly compatible with the second 'trigger' of the NA. The period of 8 years was reduced to 5 years in the Kerry-Liebermann bill (or 'American Power Act').

national REDD+ initiatives would receive credits even if the host country has adopted a national implementation scheme. In this case, national governments would receive credits for emission reductions generated in forests that are not covered by sub-national initiatives. These forests should be the primary objective of public policies and programs and other sub-national initiatives promoted by governments themselves. Consequently, after the adoption of a national implementation scheme, communities, local governments and other private actors could choose between developing their own sub-national initiatives to access international incentives directly, or join the REDD+ programs of the national government.

4.6 Reference emission levels[12]

Reference emission levels could be established sub-nationally and nationally as follows, although in practice these procedures would have to be adopted by the UNFCCC: [13]

a) Sub-national reference emission levels:
   a.1) In countries that choose to start with sub-national activities, reference emission levels would:

- Be spatial-temporal projections of historical emissions from deforestation (and degradation or any other eligible activity of the REDD+ mechanism);
- Be established using methodologies or guidelines approved by a body of the UNFCCC designated for such purposes. In principle, the methodologies developed under the Voluntary Carbon Standard (VCS) are rigorous enough and compatible with CDM rules, so that future validation, approval and registration under the UNFCCC REDD+ mechanism, or national schemes that certain countries, such as the USA, may establish independently, should be possible with few if any modifications;
- Be validated by independent auditors accredited under the UNFCCC, following procedures agreed by the Parties of the REDD+ mechanism;
- Be limited to a specific timeframe (e.g. 10 years), after which they should be reviewed and re-validated to take into account changing circumstances in the region where REDD+ activities are carried out. Within the new baseline circumstances, public policies and programs adopted after a specified date (e.g. the date of adoption of the Bali Road Map) would be excluded to avoid a perverse incentive developing for national governments to postpone the improvement of their policies and programs;[14]
- Cover reference regions that are wider than the areas covered by the individual sub-national initiatives, ideally regions with socio-economic conditions and deforestation patterns that are similar to those observed in such areas, which may

12 This section refers only to methods for establishing reference emission levels for unplanned deforestation activities. Approaches for setting reference emission levels for planned activities (legally authorized deforestation) may be different from those described here.

13 It must be noted that during its 15th session, held in Copenhagen, the COP adopted guidance for developing-country Parties in implementing REDD+ activities, which recognizes the possibility of establishing, if appropriate, sub-national systems as part of national monitoring systems (although this does not by itself imply the issuing of credits or rewards to sub-national activities, which is a decision to be agreed on by the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention and adopted by the COP). See decision 4/CP.15 (http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf#page=11).

14 This principle has its precedent in the CDM, under which policies and programs adopted after November 11, 2001 will not be considered in the additionality analysis and the baseline alternatives.

involve the entire territory administered by one or more sub-national governments, or the area covered by entire eco-regions or biomes. This is necessary to ensure that:

(i) The areas threatened by deforestation inside and outside the geographical boundaries of the initiatives' areas of intervention can be identified; and

(ii) Leakage can be measured, reported and verified against a validated reference emission level.

Where it makes sense, reference region boundaries should coincide with the boundaries of the territories administered by sub-national governments (e.g., states, provinces, districts, departments), particularly in those countries where sub-national governments have responsibilities in the forestry sector or are designing or implementing REDD+ programs. In that way, a common reference emission level and MRV system could be established for all sub-national REDD+ initiatives within the territory under the oversight of the sub-national government, which may in turn be responsible for applying national guidelines on these issues. This approach would also avoid the cost of establishing reference emission levels and of MRV systems for each of the individual initiatives and facilitate the integration of sub-national reference emission levels and MRV systems in the future national scheme.

- The geographical boundaries of the reference regions and their respective reference emission levels should be registered nationally and internationally[15] to ensure that future sub-national activities implemented in the same region are consistent (using the same regional reference emission level).

a.2) When a country adopts a national reference emission level:

- The validated and registered sub-national reference emission level should remain valid until the date provided for review, after which;

- The national government should ensure coherence between the national reference level and the existing sub-national reference levels by following methodologies adopted under the UNFCCC.

b) National reference emission levels:

- It is likely that developing countries will have to establish historical emissions (tCO_2e per year) or deforestation (ha year-1) reference levels, as such references can be objectively measured, reported and verified (e.g. average emissions or deforestation from the previous ten years). Such historical reference levels may then be adjusted to account for different circumstances (e.g. traditionally high-forest, low-deforestation countries facing increasing conversion pressure) to establish the reference for performance-based incentives.

- Emissions could be estimated and reported periodically using the methodologies and verification procedures similar to those used by Annex B countries to demonstrate compliance with their emission reduction commitments (which would ensure that credits resulting from national REDD+ activities would be of the same quality and, therefore, completely fungible).

- At the beginning of each commitment period, countries would negotiate a national

15 This is one of the requirements for the VCS to become fully compatible with the NA and the prospective REDD+ scheme regulated by the U.S. and UNFCCC. The VCS is currently assessing how it might best register such regional reference emission levels.

reference level taking into account the average emissions from the preceding period.

- In principle, these reference levels would be revised downwards as emissions are reduced so as to lead to higher mitigation volumes at each new commitment period. However, this will not be feasible for countries needing to deforest certain areas (in a controlled manner) to ensure development of critical sectors such as energy, infrastructure and food security. Therefore, historical reference emission levels may be disaggregated to differentiate:
  (i) Emissions from planned deforestation (government approved deforestation to build water reservoirs, road infrastructure and other infrastructure that is vital for national development).
  (ii) Emissions from unplanned deforestation (basically all non-authorized and illegal deforestation).

- At the beginning of each commitment period, gross emissions reduction targets for non-planned deforestation should be more ambitious than for the previous period, while the targets for planned deforestation (on a gross basis) may vary from one period to the next, and even increase, depending on national circumstances.

- To discourage and offset planned deforestation, countries would commit themselves to increasing their levels of compensatory afforestation and reforestation, which would be subject to measurement, reporting and verification. However, to protect the biodiversity of natural ecosystems, offsetting emissions from unplanned deforestation through afforestation and reforestation would not be allowed. In other words, developing countries would commit themselves to reducing planned deforestation on net basis and unplanned deforestation on a gross basis.

- It is important to highlight that decisions regarding how deforestation should be reported (planned, unplanned, gross, net, etc.) are not core one for the NA, and that any decision taken on these matters will not affect the applicability of the NA.

4.7 Leakage

To account for the possible displacement of emissions from deforestation (leakage) from areas where sub-national activities are implemented, the NA provides two options:

(i) Estimate, using approved methodologies, the emissions from leakage, and subtract them from the verified emission reductions within the sub-national initiative's area of influence (Credits = Reference emissions - Monitored emissions - Leakage).

(ii) Incorporate the sub-national initiatives into the area subject to MRV under a larger scale (sub-national or national) REDD+ program. In this case, it would not be necessary to measure, report and account for leakage of each 'nested' sub-national initiative because emissions would be measured, reported and verified by the monitoring and accounting systems of the larger program. The national or sub-national government responsible for the larger program could opt, following its own policies and

regulations, to collect some sort of compensation (for example, a percentage of the credits or a leakage tax) from the 'nested' sub-national activities which have not adopted the first option (i).

Sub-national activities would be able to choose between option (i) and option (ii) where both are available according to national REDD+ policies.

4.8 Permanence

Credits for verified emission reductions could be temporary, without the country or the sub-national developers incurring any liability (similar to the tCERs from forestry CDM projects), or permanent, backed by a 'buffer' of credits that would have to be transferred to a national permanence or reserve account, whose function would be to offset for any future emissions above the reference emission level, like the practice under the VCS program for agricultural and forestry projects. This second option is generally preferable from the standpoint of the credits' fungibility and competitiveness in the carbon market, due to the fact that temporary credits transfer non-permanent liability to the buyer, who must replace them before their expiry date, a feature which is unattractive to buyers of credits. On the other hand, the use of temporary credits allows stakeholders from developing countries to avoid responsibility for future deforestation.

Using a 'buffer' approach, national governments and promoters of sub-national activities could sell only a percentage of their credits; the rest would be transferred to the national reserve account to guarantee the permanence of emission reductions sold from all national and sub-national activities. The number of credits to be transferred to the national reserve account at the end of a MRV period[16] would be calculated using the following equation:

$$CN_{reserve} = CN_{total} * RN\% + CSN_{total} * RSN\% \quad (1)$$

Where:

$CN_{reserve}$ = Credits transferred to the national reserve account at the end of the MRV period.

CN_{total} = Credits issued internationally to the national government for national emission reductions in the MRV period.

CSN_{total} = Credits issued internationally and directly for sub-national emission reductions in the MRV period.

RN% = Percentage of CN_{total} to be deposited in the national reserve account.
Note: The value of RN% would be established by the CoP.

RSN% = Percentage of CSN_{total} to be deposited in the national reserve account.

Notes:

- In countries applying a national scheme, the value of RSN% would be set by the national government, using transparent and previously defined criteria and procedures.
- In countries without a national scheme, the value of RSN% is deter-

16 It is assumed that one commitment period (e.g. 5 years) has a fixed reference emission level that will be revised in the subsequent commitment period and that each commitment period is subject to periodical (e.g. every 1-2 years) monitoring, reporting and verification (MRV). The period of time between two events of MRV is called an 'MRV period' in this paper.

mined on the basis of a non-permanence risk assessment (similar to that used by the VCS).

4.9 Accounting

If, at the end of its first MRV period, a country reported emissions above its national reference level, the country would not receive credits, and the excess emissions would not be accounted as debits. However, the country would assume responsibility for the permanence of emission reductions sold in the market (emission reductions sold by sub-national activities would be backed from the start through buffers or temporary credits[17]).

Figure 1.a *National Reference Emission Level*

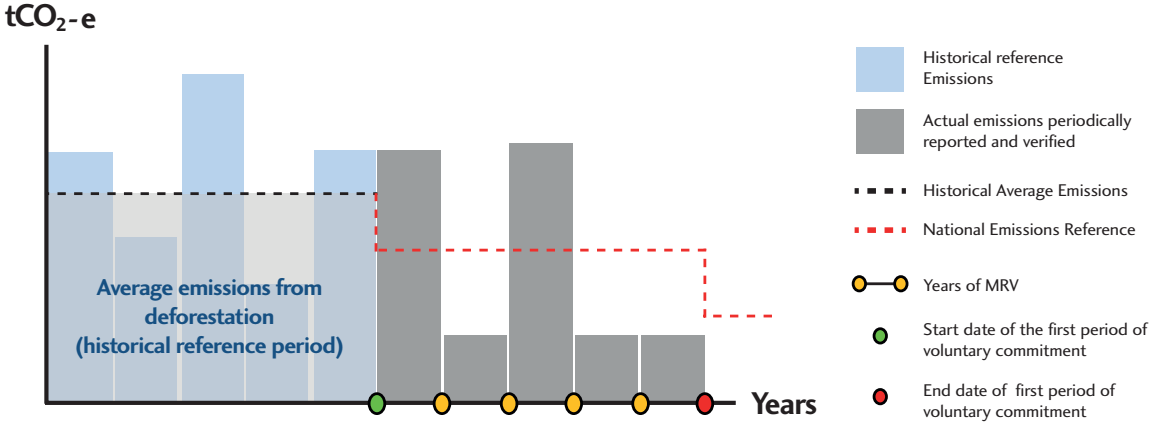
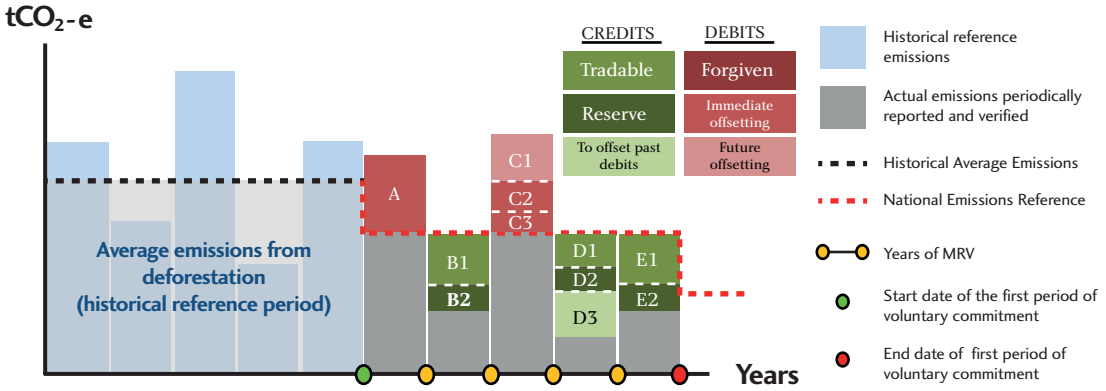


Figure 1.a shows a country's national emissions from deforestation before its voluntary commitment for REDD+ action and its actual verified emission and reference emission levels after the implementation of REDD+ action during the period of voluntary commitment. As indicated in the above Figure, 1.a, in some years its actual emissions reported and verified exceed its reference emission levels, while in some years its actual emissions reported and verified are less than the reference emissions. Upon the end of the voluntary commitment, the national reference emission level is lowered to reflect the commitment to achieve greater emission reductions.

17 It should be noted that sub-national activities transfer a percentage of their emission reduction credits to the country's national reserve account.

Figure 1.b *National Accounting*



A, B = Emissions above the baseline

B = B1 + B2 = Credits for reduced emissions; B1 = Credits sold, B2 = Credits reserved

C = C1 +C2 + C3 = Emissions above the baseline

C1 = Emissions to be offset in the following MRV period (C1 = D3)

C2 = Emissions offset by purchasing credits in the market

C3 = Emissions offset bye cancelling reserve credits (C3 = B2)

C2 + C3 = B1

D1 = Credits sold

D2 = Credits reserved

E = E1 + E2 = Credits for emissions reductions; E1 = Credits sold; E2 = Credits in reserve.

D3 = Credits used to offset emissions not offset in the previous period (D3 = C1)

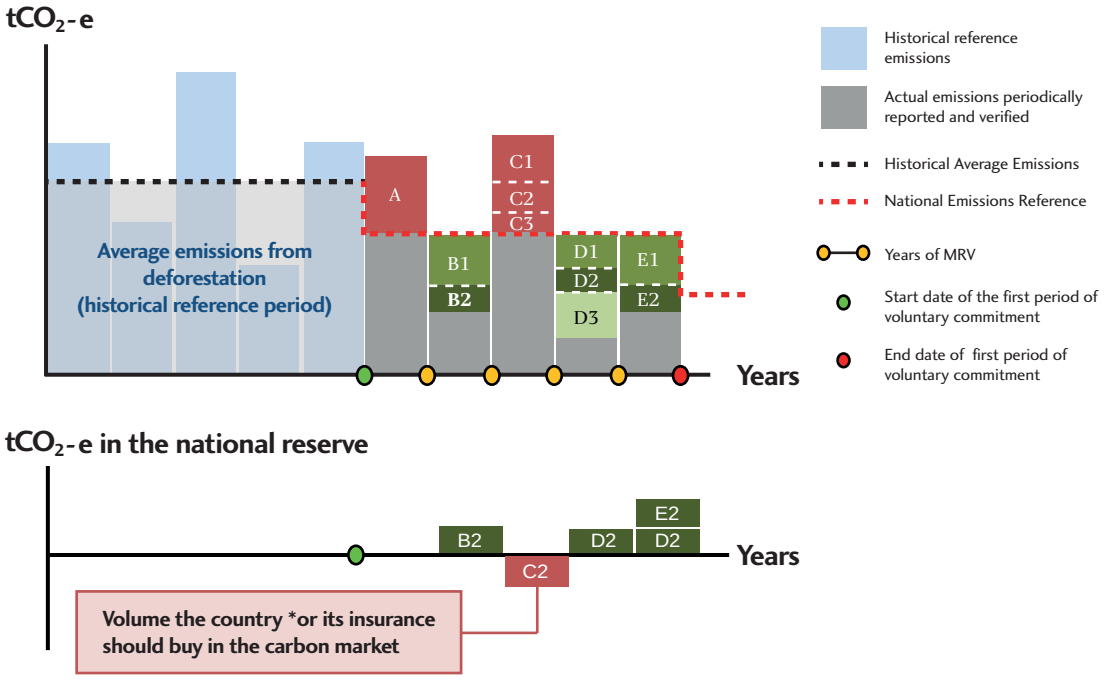
Figure 1.b shows how the amount of credits in the country's national account will change during the voluntary commitment period. During the first MRV period, the country emits more than its reference emission level, but as it is voluntary 'no-lose' commitment and the country has neither received nor sold any emission reduction credits, the excessive emissions will be forgiven. During the second MRV period the country achieved B1+B2 emission reductions, of which B1 is credits sold, while B2 is the buffer credits reserved. From then on, any emissions above the reference emission level in a future MRV period should be compensated by the country. . To compensate for the excess emissions, credits would be cancelled in the national reserve account up to the total amount of credits sold and, if that were not enough to back-up the credits sold, the country would have to buy credits in the market (including reserve credits from other developing countries, if available). Excess emissions above the total amount of credits sold may be offset through greater mitigation efforts in the next MRV period.

4.10 Net contribution to mitigating climate change

As long as a country does not increase emissions in relation to its national reference emission level, the balance of credits deposited in the national reserve account represents a country's net contribution to mitigating climate change, taking into account the fact that such credits would not be used to offset emis-

sions from developed countries (see Figure 1.c and 1.d). If deforestation continues to be reduced, the stock of emission reductions in the reserve account is carried over to the next MRV period (e.g. as represented by D2 in Figure 1.c and 1.d).

Figure 1c. *Changes in a country's national reserve under the Purely National Approach*



As indicated in Figure 1c., under a purely national approach, a country only obtains credits at the national level. Hence, during the first MRV period, the excessive emissions A are forgiven and the national reserve account's balance is zero. During the second MRV period, the country's national account achieves a balance of B2 to buffer the B1 credits sold on the market. During the third MRV period, the country's actual verified emissions are higher than the reference level, to the extent of C1+C2+C3. Among the three parts, C1 will be solved through future offset (the country will not claim credits for the same amount of emission reduction D3 in the next MRV period). The reserve in the national account, B2, will be used to cancel the same amount of excess emissions C2, while the remaining gap C3 will be cancelled by purchasing credits from the market.

Figure 1.d. *National account reserve change under the Nested Approach*

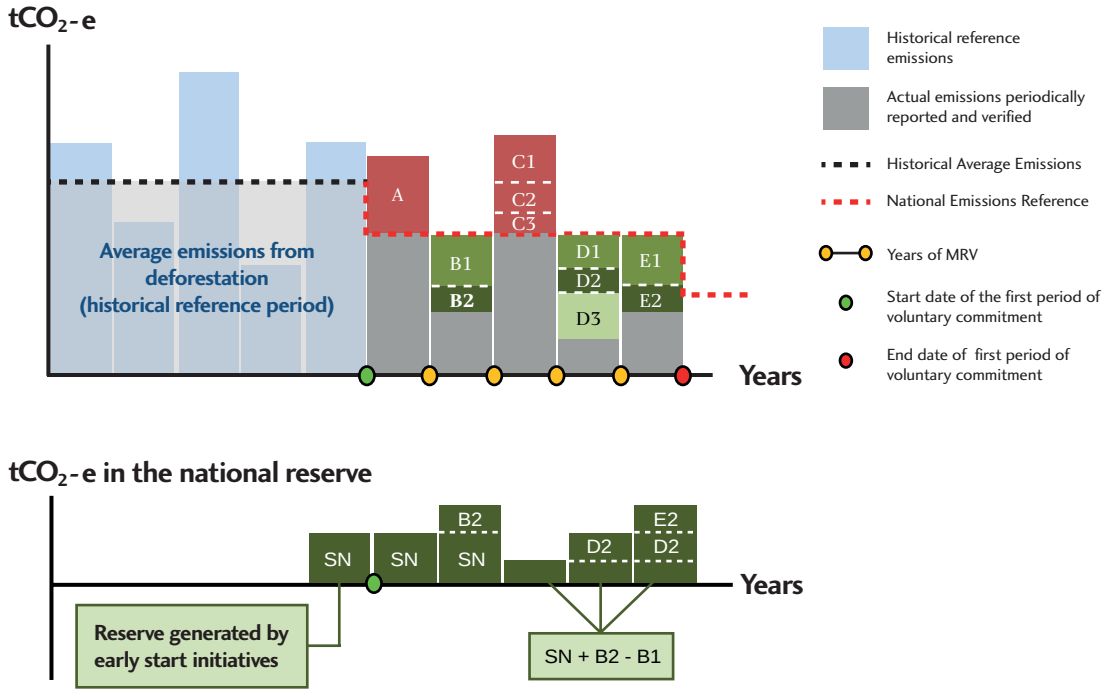


Figure 1.d shows that, using the Nested Approach, sub-national initiatives can start and receive credits before the country makes any voluntary commitment. After the starting of national voluntary commitment, sub-national programs and national programs can co-exist, their geographical scopes being mutually exclusive and their actual and reference emission levels calculated independently. Sub-national programs can continue to earn credits even when national verified emissions exceed the reference level. When they earn and sell credits, they need to transfer buffer credits based on their reserve rate to the national reserve account. If the actual deforestation, and thus emissions, exceed the reference level under sub-national programs or the national program, an equal amount of reserve in the national reserve account will be cancelled.

4.11 'Factoring out' the impact of natural disasters

If, at the end of a MRV period, a country can demonstrate that emissions were caused by natural disasters beyond its control (such as extreme weather events, volcanic eruptions, tsunamis, and other 'forces majeures'), the country would not have to account for these emissions. Methods and principles used to account for the effects of such events should be the same as those that would apply to Annex 1 countries in the post-2012 period (this issue is currently being negotiated). Additionally, to encourage the restoration of areas affected by natural disasters, these should be eligible for activities that generate carbon credits (only if natural re-growth may not be expected to happen), regardless of the date at which the disturbance happened, unless such activities are counted in the reports of planned deforestation.

4.12 Measures to avoid double counting of carbon credits

To calculate the amount of credits attributed to national governments, the volume of credits issued to sub-national initiatives would be subtracted from the emission reductions reported nationally, which would require the establishment of national or/and international REDD+ registries to track the issuance and transfer of credits.

Therefore, the domestic credits a government would receive at the end of a MRV period are calculated as follows:

$$CN_{total} = ENLB_{MRV} - ENMRV_{MRV} - ENE_{MRV-1} - CSN_{total} \quad (2)$$

Where:

CN_{total} = Credits issued internationally to the national government for national emission reductions generated during the MRV period.

$ENLB_{MRV}$ = National reference for emissions for the MRV period.

$ENMRV_{MRV}$ = National emission measured, reported and verified for the MRV period.

ENE_{MRV-1} = National emissions above the reference level for the previous period (MRV-1) that have not been offset by canceling reserve credits or acquiring credits in the market. Note: ENEMRV-1 will always equal zero for countries that never received credits for national emission reductions.

CSN_{total} = Credits issued internationally for sub-national emission reductions in the MRV period.

It is important to note that for the same MRV period CN_{total} could be less than zero, in which case the country would not receive credits (and CN_{total} would be considered equal to zero), while CSN_{total} could be greater than zero – that is, the sub-national initiatives that successfully reduce emissions over a period would receive credits, even if in the same period the entire country has emissions above the reference level. Moreover, if a country started with sub-national activities before adopting a national scheme, the national buffer reserve account would have a positive balance (generated by the same sub-national activities), which would allow the country to offset emissions debits that may occur later at the national level (see Figure 1.d).

The credits issued to sub-national initiative would be calculated using equation (3) in countries that have not yet initiated a national scheme and equation (4) in countries that already have adopted a national MRV scheme.

$$CSN_{total} = ESNLB_{MRV} - ESNMRV_{MRV} - ESNF_{MRV} \quad (3)$$

$$CSN_{total} = ESNLB_{MRV} - ESNMRV_{MRV} \quad (4)$$

Where:

$ESNLB_{MRV}$ = Sub-national emissions reference level for the MRV period.

$ESNMRV_{MRV}$ = Sub-national emissions measured, reported and verified for the MRV period.

$ESNF_{MRV}$ = Leakage emissions by sub-national activities.

Notes:

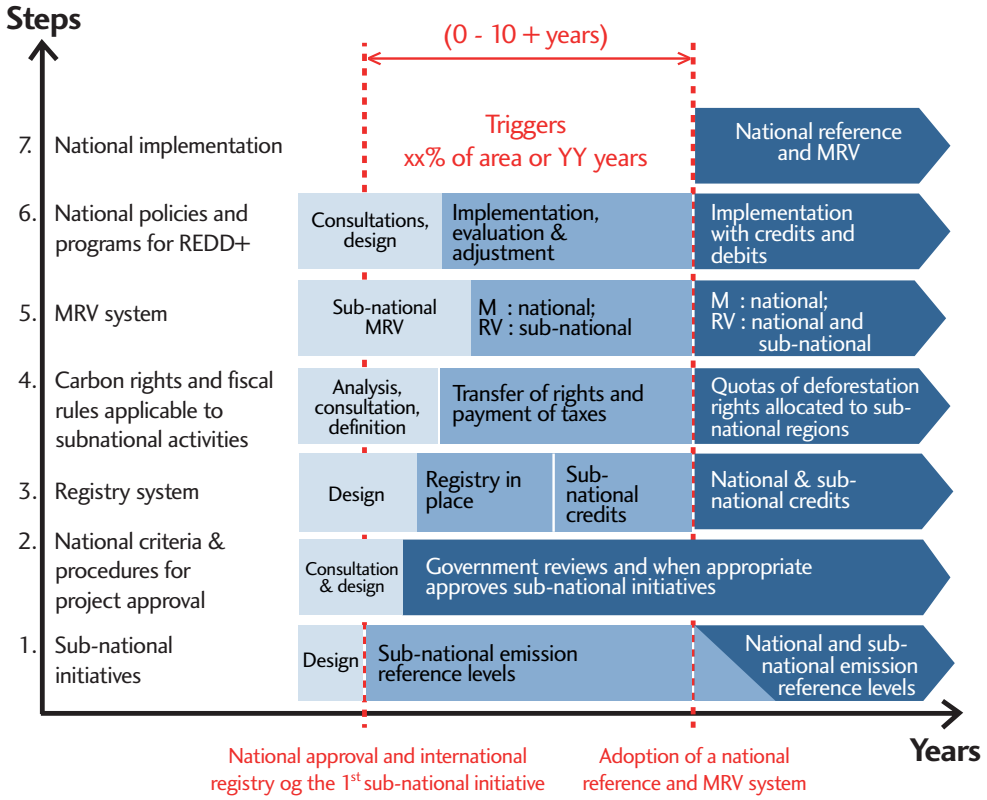
- In countries that have initiated a national scheme, the $ESNF_{MRV}$ factor is automatically included in the variable $EN_{MRV,}$ which is why leakage does not appear in equation (4).
- National governments can freely decide whether or not to collect a percentage of the CSN_{total}, or a tax, from sub-national activities for leakage as compensation for the sub-national leakage they assume and in order to obtain additional resources to implement

their national REDD+ programs. However, it would be more logical for governments to tax those activities that cause deforestation (including planned deforestation)[18] and to minimize the tax (and bureaucratic) burden of sub-national activities so that these multiply quickly and help reduce deforestation.

5. Steps to implement the NA in a developing country

The implementation of the NA may occur in successive steps, starting in some countries with the development of independent sub-national activities, ending with a complementary set of activities under a national accounting framework, and whose aggregate result would be monitored, reported and verified at the national level[19]. In other countries, the first step may be the development of a national implementation system, and only afterwards would sub-national activities be allowed. Therefore, the main steps in the process can occur in a bottom-up sequence, a top-down sequence, or simultaneously. We assume that in many developing countries the typical sequence will be bottom-up, initiating with sub-national activities and ending with a comprehensive national scheme (see Figure 2).

Figure 2. *Example of steps and timelines for implementing the Nested Approach*



18 This principle has been included in the Peruvian Law of Ecosystem Services (still in the Peruvian Congress).

19 Yet records of individual sub-national initiatives' outcomes would be maintained, thereby ensuring that successful initiatives receive compensation while preventing, through the registration system, the double counting of carbon credits.

As illustrated in the previous figure, the main steps to implementing the NA starting from sub-national activities can be summarized as follows:

The implementation of the NA may occur in successive steps, starting in some countries with the development of independent sub-national activities, ending with a complementary set of activities under a national accounting framework, and whose aggregate result would be monitored, reported and verified at the national level.

1) Preparation of voluntary sub-national initiatives, based on UNFCCC guidance, although they could have begun before such guidance was issued by using internationally recognized standards for carbon accounting and project design. In such cases, sub-national initiatives would need to apply subsequently the methodologies and procedures defined by the UNFCCC if the standard applied initially is not compatible with such methodologies. In the final stage, when the host country has adopted a national reference emission level, the sub-national reference emission level could be defined by using internationally approved methodologies, which should provide guidance for ensuring consistency between sub-national and national reference levels, or be assigned by the national government to the sub-national area (e.g. as a fraction of the national reference emission level) using a nationally defined mechanism.
2) Definition by the national government of transparent criteria, procedures, and expeditious review and endorsement of sub-national activities.
3) Registration of sub-national activities, including their spatial and temporal boundaries, reference emission levels, verified emission reductions and carbon credits, to ensure an orderly and consistent process for defining the sub-national reference emission levels and to avoid any possibility of double counting emission reductions.
4) Definition of emission reduction ownership rights and removal of any ambiguity from the fiscal system applicable to carbon credits within the national regulatory framework.
5) Transition from isolated sub-national monitoring systems to a single integrated and institutionalized national accounting, monitoring and information system.
6) Improvement, design and implementation of national policies and programs and their subsequent evaluation and adjustment to enable them to become truly effective for REDD+.
7) Adoption of a national reference emission level in the land-use or forestry sector.

The steps described above are indicative only and may vary from country to country, depending on national circumstances, capacities and REDD+ policies.

6. Conclusion

This paper has provided a detailed description of the 'Nested Approach' (NA), a proposal designed to promote the immediate and widespread participation of countries and stakeholders in REDD+ activities by mobilizing adequate levels of private and public funding

whilst maintaining environmental integrity. As is now acknowledged by many stakeholders in the international policy process, 'a nested approach to REDD+ has the potential to address many of the drawbacks of pure national or pure sub-national approaches by accounting for in-country leakage, engaging national governments, and taking advantage of certain economies of scale, while also motivating sub-national actors to participate in REDD+ and attracting greater private investment' (Cortez et al., 2010). It also has the potential to yield greater returns in terms of carbon effectiveness, cost efficiency and equity (Angelsen et al., 2008). In a context where donor countries have committed substantial, but still insufficient, public funds to REDD+ through various bilateral and multilateral channels, and where national and sub-national governments as well as civil society and the private sector have launched several REDD+ initiatives, the NA remains an important proposal for building an international agreement on reducing emissions from deforestation and forest degradation.

Although the proposal was originally published by a group of UNFCCC observers, it was later submitted to the UNFCCC by a group of Latin American countries. Some of these countries have changed their position relative to the climate-change policy negotiations in general and REDD+ in particular, while others are still supporting their original proposal and are currently trying to implement the NA in a context where the future of the overreaching climate-change agreement is still highly uncertain. Some countries, including Colombia, Brazil, Guatemala, Indonesia, Peru and the USA, are already discussing how to use the approach described in this paper in their national climate-change programs and laws.

Moreover, it is worth noting that the NA described here is compatible with the basic elements of the REDD+ mechanism being defined in the current UNFCCC negotiations. The text on a REDD+ mechanism being negotiated by the Ad Hoc Working Group on Long-term Cooperative Action contains the possibility (although between brackets) of implementing 'sub-national strategies' and requests developing country Parties to establish a robust and transparent national forest monitoring system, 'with, as appropriate, sub-national monitoring and reporting as an optional interim measure', whilst the guidance for developing-country Parties in implementing REDD+ activities adopted by COP15 recognizes the possibility of establishing, 'if appropriate, sub-national systems as part of national monitoring systems'.

The authors hope that this paper will contribute further to a positive discussion of REDD+ that urgently needs to conclude with an agreement that will enable developing countries to scale up their capacity and commitment to reduce the speed at which the remaining tropical forests, their biodiversity and forest-dependent people are lost.

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Section 3

Community Engagement

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Pursuing REDD+ through PFM: Early Experiences from the Bale Mountain's REDD Project in Ethiopia

Abstract
In an effort to reverse the situation of deforestation and forest degradation that is threatening the livelihood security of Ethiopia's largely rural population, Participatory Forest Management (PFM) has been initiated and has proved to be a viable strategy. As PFM brings about improvements in forest condition, it can also be linked to carbon finance. Drawing on early experience of a Reduced Emissions from Deforestation and Degradation (REDD) project being developed in the Bale Mountains Ecoregion, this paper outlines how REDD can be pursued through PFM and how forestry carbon can act as a catalyst in shifting towards sustainable forest management in Ethiopia

1. Introduction

The Bale Ecoregion Sustainable Management Program (BERSMP) is a partnership initiative between Oromia Forest and Wildlife Enterprise (an autonomous public enterprise) and two NGOs: FARM-Africa/SOS Sahel Ethiopia. The Program is funded by the governments of Ireland, the Netherlands and Norway and implements a Participatory Natural Resource Management intervention in the Bale Mountains area. One of the six component themes of the program is to ensure continuity of the community-based conservation approaches aimed at identifying sustainable financing opportunities, mainly focusing on carbon trading.

The paper provides a case study of the Bale Ecoregion Sustainable Management Program, where a REDD project with Participatory Forest

Management (PFM) is being set up. It shows how PFM, an approach that has proved successful in forest conservation, can be linked to REDD in order to create new opportunities to address better the long-standing threats to forest resources. In addition, the expected risks associated with REDD implementation and ways of mitigating these are also discussed.

PFM is a working partnership between government (the official owner of the resources) and forest communities for forest conservation that involves sharing responsibilities, roles and benefits so as to restore biodiversity and improve the livelihoods of forest-dependent communities.

While REDD+ is achieving increasing recognition as a critical strategy for mitigating climate change at the national and international levels, it is hoped that the early experiences of the Bale REDD will be picked up by similar initiatives in Ethiopia and elsewhere.

2. Forest Status in Ethiopia

Ethiopia is a country of 80.7 million people, with a total land area of 1,104,300 square kilometers (UNdata, 2008). According to the FAO (2009), the extents of forest[1] and other wooded land[2] in Ethiopia are estimated to be 13 million ha (including a 491,000 ha forest plantation) and 44.6 million ha respectively. The forest area covers 11.9% of the country's land area.

The same document states that the estimated deforestation rate in Ethiopia is 141,000 ha per year (or 1.1%). Recent estimates of deforestation rates for selected woredas[3] of the Bale Mountains revealed a rather severe situation. For example, deforestation in the two woredas of Nensebo and Berbere was as high as 6.5% and 8.1% per annum respectively between 2001 and 2006 (BERSMP, 2009). This means that the 2006 forest area for the two woredas was respectively 67.4% and 59.3% of the cover in 2001.

Owing to the unsustainable nature of human activities in relation to them, the forests are exposed not only to deforestation and fragmentation across the landscape but also to degradation (the thinning out of the biomass stock without loss of forest area). Even though extensive areas have clearly been affected by forest degradation, the lack of up-to-date data has made it difficult to record the situation definitively.

The main drivers for deforestation and degradation of the natural high forests and woodlands are agricultural encroachments in the forests, livestock grazing with detrimental effects on the natural regeneration, and unsustainable wood harvesting.

Even though considerable efforts have been made during the past few years to increase forest cover through massive tree-planting programs and area closure activities, the effects of these efforts simply could not keep pace with the level of forest land-use changes.

1 Forest is defined as land spanning more than 0.5 hectares with trees higher than 5 m and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ (FAO, 2006).

2 Other wooded land is land not classified as forest, spanning more than 0.5 hectares, with trees higher than 5 m and a canopy cover of 5–10 percent, or trees able to reach these thresholds in situ, or with a combined cover of shrubs, bushes and trees above 10 percent (ibid.).

3 The woreda is a lower-level administrative unit equivalent to a district.

3. Experiences with PFM in Ethiopia

Continued deforestation and forest degradation have made it clear that the conventional approaches to managing forests in Ethiopia are not able to guarantee the conservation of such resources. It was therefore found necessary to consider a system which can give local people well-defined rights and obligations over local forest resources and provide incentives for sustainable forest management, namely PFM.

Over the last fifteen years, the two NGOs, FARM-Africa and SOS Sahel Ethiopia, have successfully promoted PFM in Ethiopia through the facilitation and provision of technical support. Based on the positive outcomes achieved, PFM has been incorporated into regional and federal forest policies. Currently, the total forest area under community–government joint management in Ethiopia is about 300,000 ha. Two new projects for scaling up PFM in four regional states, funded by the European Union, have just been launched, one by the Federal Ministry of Agriculture and Rural Development, the other by FARM-Africa and SOS Sahel Ethiopia. It is expected that more areas will come under PFM in the near future.

PFM is a working partnership between government (the official owner of the resources) and forest communities for forest conservation that involves sharing responsibilities, roles and benefits so as to restore biodiversity and improve the livelihoods of forest-dependent communities. In this arrangement, the community groups will manage and develop the forests and utilize forest products and services in a sustainable way. The government is providing technical and administrative support. Any revenue generated from the forest is shared in accordance with the signed agreements based on the level of responsibilities and roles. These close partnerships under PFM have brought about the stabilizing and even reversal of deforestation and forest degradation.

It is now widely accepted that PFM is effective, not only in terms of the conservation of forests and biodiversity, but also in contributing to sustainable rural livelihoods and hence to poverty alleviation. Participatory Natural Resource Management is about involving local people, institutions and other relevant stakeholders in the management of natural resources and is recognized as one of the most viable approaches for sustainable development and for increasing people's responsibility and sense of ownership (Borrini-Feyerabend et al., 2000). In those areas where PFM has been implemented, significant improvements have been recorded regarding forest condition and management, as well as rural livelihoods and social issues.

The positive impacts on forest conditions include increased forest regeneration (with a marked decrease in deforestation rates); greater respect of forest boundaries by local communities; community-initiated tree-planting on degraded forest areas; more efficient use of forest products; reappearance of wildlife; a tighter control of open access; a lower incidence of forest fires; and a decline in forest protection costs for government. Rural livelihoods are more secure and sustainable as a result of increases in financial returns and a sense of local empowerment gained through the securing of legal rights. Another benefit is a sustainable supply of forest products (water, medicines, firewood, food, timber) which local communities can use or sell to contribute to improvements in the livelihoods of the local population. Moreover, PFM has resulted in improved relationships among the communities as a result of conflict mediation practices and the exercise of good governance through democratic functioning of the community-based organizations (CBOs) (Tadesse, 2008).

4. Significance of the Bale Mountains

The Bale Mountains of Ethiopia (with the Bale Mountains National Park at their center) represent the second largest stand of remaining moist tropical forest in Ethiopia. They are inside the 'Eastern Afromontane' biodiversity hotspot, one of the world's 34 hotspots (Conservation International, 2007), and contain the largest Afro-alpine habitat on the African continent (ca. 100,000 ha). Located within the Regional State of Oromia (see map 1), the Bale Mountains are of critical economic, biodiversity and ecological importance.

The main central area of the Bale Mountains is a high plateau, most of which is over 4000 meters above sea level (masl), with several peaks rising from it. The highest of them is Tulu Dimtu (4377 masl), the second highest point in Ethiopia. South of the plateau the land falls steeply to the moist tropical Harena Forest, starting at approximately 3700 masl and extending down to 1500 masl. The northern area is made up of high ridges and broad valleys mainly lying at altitudes of 3000-3500 masl and comprising Juniper (Juniperus procera) and Hagenia (Hagenia abyssinica) woodlands, grasslands and wetlands.

The area harbors a unique and diverse fauna and flora which include a large percentage of Ethiopia's endemics (26% of endemic fauna), with some species only found in Bale. For example, over half the global population of Ethiopian wolves (Canis simensis), the rarest canid in the world (found only in suitable Afroalpine habitats of Ethiopia and listed as 'endangered' by the International Union for Conservation of Nature [IUCN]), the largest population of the endemic Mountain Nyala (Tragelaphus buxtoni) (estimated to be approximately two-thirds of the global population) and the entire global population of the Giant Mole-Rat (Trachyoryctes macrocephalus) are found in the Bale Mountains (BERSMP, 2006). The Mountains are also home to stocks of valuable genetic material, including wild coffee (Coffea arabica).

In addition to these biodiversity values, the area is of significant benefit to the more than twelve million people downstream who are dependent on its ecological processes, primarily water. Four major rivers arise from the massif: the Wabe Shebelle, Web, Welmel and Dumal. Moreover, the water for numerous springs in the lowlands originates in the Bale Mountains. These rivers are the only sources of perennial water supply for the arid lowlands of the east and southeast of Ethiopia, including Somalia and parts of northern Kenya. The livelihoods and food security of the people in these lowland areas, particularly during the dry season, are therefore highly dependent on good environmental management in the highland areas.

However, unsustainable resource exploitation throughout the massif, resulting from agriculture expansion, livestock pressure and the unsustainable use of wood and other products, has led to degradation and is increasingly threatening the unique biodiversity and the livelihoods of people who are directly dependent on the natural resources, including the all-important watershed values.

This situation led to the launching of the BERSMP initiative in 2007 with the goal of contributing to the enhancement of the unique biodiversity and vital ecological processes of the Bale Mountains Ecoregion and the social and economic well-being of communities that are dependent on the natural resources of Bale.

The initiative focuses on combining and expanding conservation and development actions, bringing local communities into a central role in sustainable natural resource management, and promoting sustainable natural resource-based livelihoods. This is being done by involving local communities as stakeholders in the sustainable management of the area, supported by government services. To this end, the program is facilitating and enabling the relevant government offices to integrate the needs of conservation and development by developing a strong implementation partnership with the Oromia Forest and Wildlife Enterprise and other relevant regional, zonal and woreda government offices.

The program is based on models and on the experience of recent work in Ethiopia, specifically, experience and best practices developed in community-based natural resource management, participatory development and livelihoods diversification in the Oromia region.

5. The need for sustainable finance

The aim of sustainable financing mechanisms is to secure and ensure long-term finance for conservation program objectives beyond the lifespan of a project or program. Such projects and programs normally secure financial resources from various sources (government, donors, etc.) to support a project's development and implementation. Sustainable finance goes beyond the usual government or donor funding by introducing innovative market-based approaches such as payment for ecosystem services.

Conservation finance is also increasingly valued as a mechanism to help alleviate poverty by creating equitable approaches to sustainable financing that benefit rural populations through the enhancement of sustainable livelihoods (WWF, 2007).

The practice of PFM that has been initiated by the Bale Ecoregion Sustainable Management Program cannot succeed without the continued technical support of Oromia Forest and Wildlife Enterprise and incentives for the communities involved. This also becomes apparent when seen from a sustainability point of view, that is, taking into account the period after such PFM projects come to an end. Hence, if large areas of forest such as that in the Bale Mountains are to be managed in a sustainable manner through community–government partnership in order to continue providing forest products and environmental services, long-term finance is needed to cover the costs. The Bale REDD project aims to meet this need. By avoiding deforestation that would have occurred in the project's absence, carbon credits are generated and sold to individuals or organizations in the voluntary carbon markets.

Hence, if large areas of forest such as that in the Bale Mountains are to be managed in a sustainable manner through community–government partnership in order to continue providing forest products and environmental services, long-term finance is needed to cover the costs.

A critical aspect of this process is the sharing of the revenues that will be generated between the OFWE and communities, as both major actors will bear the costs of conservation, but with distinct roles. Apart from determining who gets what, it is also important to work things out carefully and make sure that the shares reach

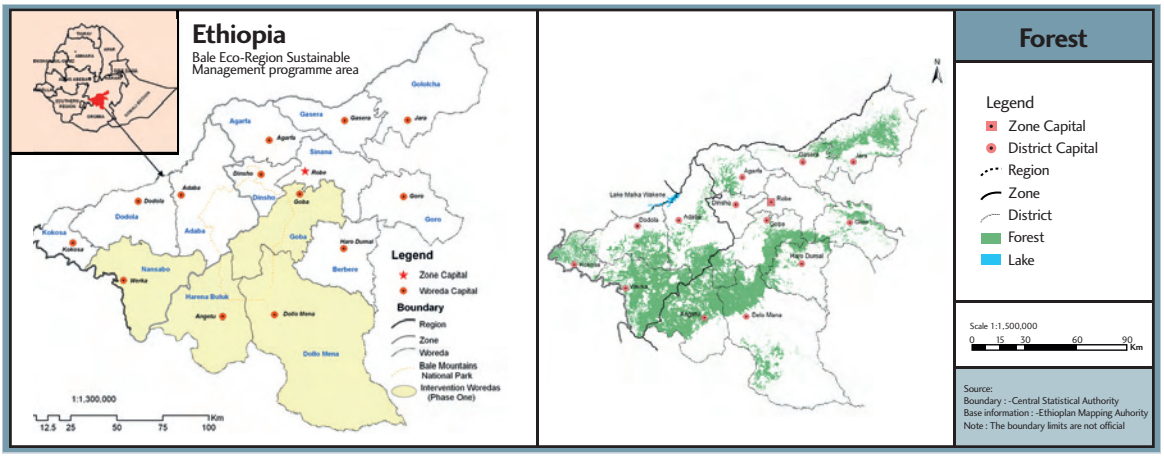
the communities in order for the project to be successful. Even though communities and the OFWE have some common understanding about carbon revenue sharing, no consensus has been reached so far on how that will be done. It should also be remembered that, as a wide range of costs need to be covered for forest conservation activities, leakage mitigation actions, monitoring, etc., only some of the revenues will be available for sharing.

The current plan is to establish a 'forest fund' managed by representatives of the OFWE, community-based organizations, and other relevant bodies. This fund will receive a large proportion of the carbon revenues, and OFWE will facilitate a performance-based distribution of funds to communities through their 'community-based organizations' (CBOs). The search for an effective way of revenue sharing and implementation mechanism is still going on.

6. The Bale Mountains REDD project

A study conducted by the Bale Ecoregion Sustainable Management Program to identify sustainable financing opportunities for the Bale Mountains has come up with an assessment of the general environmental services that could be included in Payment for Environmental Services. Based on this assessment, a business case for a carbon finance project has been drawn up and a Project Idea Note (PIN), including a legal, institutional, and technical project design, prepared in order to approach carbon funds.

Map 1. *The Bale Mountains location and forest areas (Source: BERSMP)*



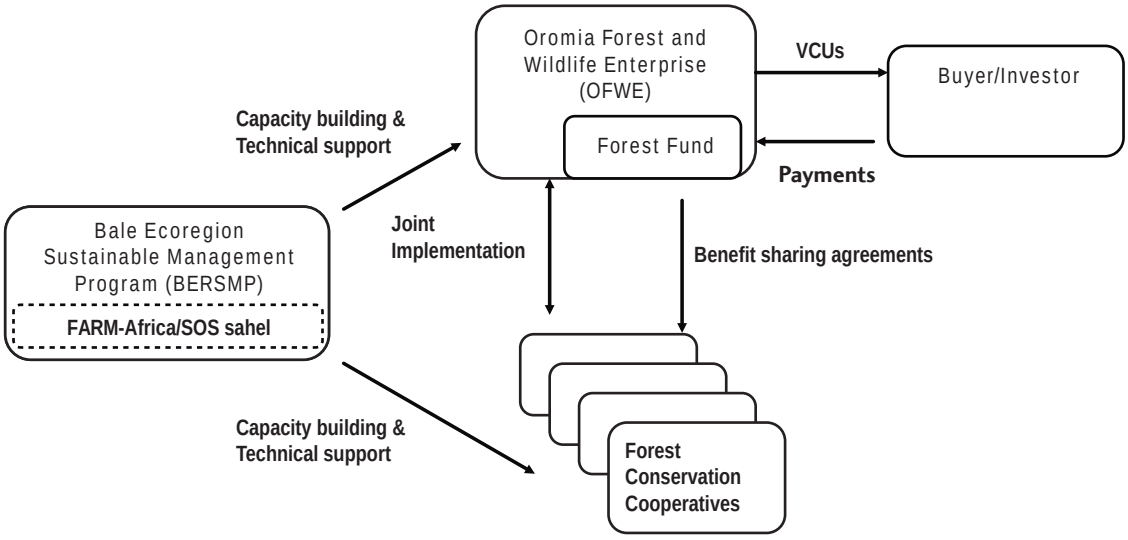
6.1 Project Structure and Management

The aim of the Bale REDD project is to reduce emissions from deforestation and forest degradation in the Bale Mountains Ecoregion of Ethiopia. This will be done through the protection and rehabilitation of the natural forests in the area and will be coordinated by OFWE.

On-the-ground project implementation and management activities will be carried out by the two OFWE branch offices (Bale Branch Enterprise

[BBE] and Arsi Branch Enterprise [ABE]) and the local forest conservation cooperatives (CBOs) that are currently being established (Figure 2). FARM-Africa and SOS Sahel Ethiopia will provide technical support to the enterprise branch offices and the CBOs through the BERSM Program (Figure 2).

Figure 2. *Proposed organization of the Bale Ecoregion REDD Project*



The above structure briefly indicates that, under the BERSMP, capacity-building and technical support will be provided to the Oromia Forest and Wildlife Enterprise and the Forest Conservation Cooperatives (CBOs). REDD implementation is carried out jointly by OFWE and the CBOs. OFWE delivers the voluntary Carbon Units (VCUs) to the buyers and receives payments in return. Based on agreements to be signed, the benefits will be shared among OFWE and the CBOs.

So far, Joint Forest Management Agreements (JFMAs) have been signed with nine CBOs covering over 70,000 ha of forest. Additional CBOs are being established, and more JFMAs will be concluded. In the near future, these agreements will be supplemented with benefit-sharing modalities that determine the distribution of revenues generated from the sale of carbon credits.

6.2 Ownership of Carbon Credits

Based on the 1995 Constitution of the Federal Democratic Republic of Ethiopia, the ownership of land and other natural resources, including natural forests, is vested in the people and the State. But the right to use land and forests can be transferred by the State to individual users, communities, and others (Federal Democratic Republic of Ethiopia, 2007; Oromia National Regional State, 2009).

In terms of ownership, therefore, the REDD project's land and forests (approximately 700,000 ha in total) fall under two government agencies:

- The Oromia Forest and Wildlife Enterprise (OFWE), a regional agency that has under its authority all the forest area within the Bale Ecoregion (ca. 500,000 ha), with the exception of the Bale Mountains National Park (BMNP); and

- The Ethiopian Wildlife Conservation Authority (EWCA), a federal agency that administers the Bale Mountains National Park, a ca. 200,000 ha area located at the centre of the Bale Ecoregion.

This means that ownership of the carbon credits is retained by OFWE and EWCA, the appropriate authorities to sell carbon credits generated by the project under Ethiopian law. Even though the two areas are under different jurisdictions, the REDD project that is being developed is a combined one. The two agencies are currently working out a modality of partnership.

6.3 Project Design

According to the analysis made with respect to the Voluntary Carbon Standard (VCS), the planned project activities would mostly be regarded as Avoiding Unplanned Frontier Deforestation and Degradation (AUFDD) under the VCS's Agriculture, Forestry and Other Land Use (AFOLU) Guidelines and are eligible as a REDD project (UNIQUE Forestry Consultants, 2010).

The reference area for the project consists of the project area, which will include all natural forests in the Bale Mountain Ecoregion, a total of more than 700,000 ha (including the National Park); and the leakage belt, an estimated area of 140,000 ha that includes woodlands adjacent to the project area that will be affected as a result of the project activities.

For preparation of the initial technical analysis, REDD Modular Methodology, the draft methodology proposed by Avoided Deforestation Partners[4] was used. This methodology was selected on the basis that it is designed to address a wide range of potential project scenarios and also includes the methodology that was previously proposed by the BioCarbon Fund[5].

6.4 Preliminary baseline, elaboration of carbon stocks and carbon credits

As part of the setting up of the carbon model to calculate the expected emission reductions for each woreda, a preliminary baseline rate of deforestation was developed using historical data based on Landsat / SPOT images from 1986, 2002 and 2006. These data are for six woredas (Adaba, Berbere, Dodola, Dolo Mena, Harenna Buluk and Nensebo) out of fourteen in the project area and cover a forest area of approximately 400,000 ha. The data from these woredas indicates an increasing rate of deforestation, averaging 3.44% in the period from 2001-2006 and 1.3% from 1986-2001.

Some of the woredas have high deforestation rates of up to 8% and some are at relatively lower rates of about 1%, owing to the existence of a customary management system due to the presence of coffee forest.

With respect to carbon stocks, the average above- and below-ground carbon stocks across the project area was estimated to be 185 tons/ha by taking the low end of the Intergovernmental Panel on Climate Change (IPCC) range for tropical Africa, reflecting the widespread degradation in the project area. Field data were also used from the Bale Mountains National Park to estimate below-ground biomass from above-ground data (UNIQUE Forestry Consultants, 2010).

4 REDD Methodology Modules. http://www.americancarbonregistry.org

5 Methodology for Estimating Reductions of GHG Emissions from Mosaic Deforestation. http://www.communitycarbonforestry.org

Taking into account the uncertainty regarding the methodological requirements, a preliminary emission reduction potential of 18.5 $MtCO_2$ over twenty years without taking into account leakage and non-permanence and a marketable volume of 6.4 $MtCO_2$ or 2.7 $MtCO_2$ over ten years (taking into account leakage and non-permanence) was estimated.

This preliminary estimate of the potential carbon credits that can be transacted was based on a number of assumptions. Annual deforestation rate was taken as 4% in the baseline. With regard to leakage, a 25% rate was assumed by taking the mid-point between typical ranges of 10% and 40%. For non-permanence, a 40% buffer at the high end of the range was considered. It is also assumed that the effectiveness of REDD activities will increase over the years (UNIQUE Forestry Consultants, 2010).

6.5 Next actions

Baseline of carbon stocks within different strata and Project Design Document (PDD) including third-party validation leading to registration are the next significant actions.

The baseline model will be developed in such a way that it does not rely only on observed historical rates but also incorporates socio-economic drivers, such as projected population growth (using a statistical relationship between past deforestation and population), and that it covers the entire project area and leakage belt. Moreover, a field inventory will also need to be undertaken to establish the carbon stocks in the project area, including the leakage belt at the start of the project.

Another piece of work also involves a full elaboration of the monitoring plan. The approach will be based on the approved methodology and will generally involve obtaining classified forest-cover data from satellite imagery for the project area, and estimating emissions associated with any losses since the start of the project or since the date of the last monitoring event (using the carbon stock data of the initial field inventory).

An analysis of the social aspects, including awareness-raising on climate change and avoided deforestation, will be conducted with the local communities. One immediate action is also related to working on the benefit-sharing arrangements with detailed implementation modality.

The current plan is to establish a 'forest fund' managed by representatives of the OFWE, community-based organizations, and other relevant bodies. This fund will receive a large proportion of the carbon revenues, and OFWE will facilitate a performance-based distribution of funds to communities through their 'community-based organizations' (CBOs).

7. Linking PFM with REDD+

The details of each PFM type may vary based on forest type, forest condition, socio-economic issues, etc., but in most cases an agreement is signed between the community and the Forest Agency (in the case of PFM in a state forest) in which a management plan is drawn up for a given block of forest. The community will be granted use rights over forest products (firewood, NTFPs, and in some cases also timber). In

return, some activities to protect and develop the forest are taken on by the community, most often patrol duties, seedling plantings, and tending operations. Bylaws regarding the use of forest products and the grazing of cattle are established, and the CBO is empowered to manage it, often including the distribution of benefits among community members and the collection, management, and use of community funds that are derived from sales of produce and from fines imposed on transgressors (Skutsch, 2010).

If under such initiatives communities are able to manage forests in a sustainable way, then forests will be protected from degradation. This also means that the rate at which carbon dioxide is emitted into the atmosphere is reduced. Therefore, PFM could be one means for countries to implement REDD+.

One of the impacts of PFM is that tree cover is increased. For example, a change-detection study in the Adaba-Dodola forest compared the state of vegetation between 2002 and 2006 in community-managed forest blocks and found that forest cover had increased by up to 15.6% in these blocks (Ameha et al., 2006). If PFM results in increased tree cover, it can be concluded that it leads to increased sequestration of carbon.

Such positive impacts of PFM on forest conditions indicate that PFM should be used as a strategy for REDD+ implementation. Obviously, the additional gains from REDD could be an incentive to forest conservation, and this will in turn positively contribute to the success of PFM. REDD is also seen as more cost-effective than other methods of carbon sequestration (Banskota et al., 2007). Watersheds and riparian areas are protected as a result of the restoration of forest areas, and this has positive impacts on the enhancement of agricultural productivity. Expected revenues from REDD will create employment and new livelihoods. Pursuing REDD through PFM also allows the continued use of forest products by the communities involved, which could serve as a safety net for those who depend more on the forests and help to maintain their traditional livelihoods and culture. An integrated part of PFM is the organizational frameworks for the effective protection, development and proper utilization for forest resources. Organizational frameworks designed for sustainable forest management could be fundamental inputs for REDD implementation.

As indicated earlier, the main approach to achieving the envisaged improvements in forest conservation and livelihoods in the project region is the adoption of PFM. Even though the scope of PFM covers a wide range of targets and activities, originally it was not designed as a REDD implementation approach. Its major aim is the maintenance of forest condition and improvement of livelihoods. Therefore, assessment of any gap in the ongoing PFM implementation activities against the planning and implementation requirements of REDD has been done for adjustment as necessary.

In this connection, the future PFM approach and proposed management activities in light of the actions necessary for REDD are being drafted. The Implementation Plan outlines the necessary activities (including estimated quantities and costs) and proposes a timeline for their implementation.

8. Challenges, risks and mitigation strategies

As forest degradation remains difficult to estimate, designing a proper method for assessing it, especially over large areas of forest, will remain a significant challenge.

A transparent system needs to be in place for allocating financial rewards when they come. A strong and reliable structure for the implementation of benefit-sharing is required for the system to operate smoothly. It should also be noted that, even without REDD, PFM is already a demanding task. Additional activities such as monitoring and reporting require a strong commitment from both the communities and the government forest agency.

Some of the risks involved in REDD implementation include 'leakage', that is, the displacement of deforestation from the project boundary to other places, leading to lower actual net carbon savings by the project. The entire project area needs to be conserved, and the 'leakage belt' should also be managed and monitored. The main leakage risk is expected to be from agricultural expansion. However, based on previous experiences with PFM in areas within the Bale Mountains and elsewhere, communities greatly appreciate the concept of sustainable forest management and will therefore agree to regulate the expansion of agriculture.

Based on the WBISPP supply and consumption pattern estimates, it is necessary to establish approximately 4,000 ha of new plantations to compensate for fuel wood supply from the natural forests in the project area. BERSMP is undertaking ongoing plantation activities through supporting communities to establish some 2,000 ha of woodlots (to which the communities have full access) by 2012. OFWE is also funding the establishment of additional 200 ha/year woodlots over the next ten years. Details of the timeline and responsibility for the establishment of the woodlots are to be outlined in the REDD Implementation Plan. The new plantations and community woodlots will enable households to have alternative sources of wood for fuel and construction materials. Without such measures, it is possible that deforestation will merely shift outside the project area, leading to no actual emission reductions.

In addition, efficient cooking stoves (including wood-saving and solar-powered ones), which can reduce current fuel-wood requirements, are being introduced, with the aim of covering some 10,000 households in the coming two years. This could be supported by raising awareness about alternative fuel-wood sources such as establishing fuel-wood hedges.

The other risk is 'reversibility' or the risk of non-permanence. Carbon sequestered and credited from forests can be released back into the atmosphere in case of a fire, tree diseases, or other unexpected deforestation. Such incidents could cause non-permanence resulting in a failure to deliver the expected emission reductions. An effective forest-fire management system focusing on prevention activities to reduce the related risk will be drawn up. Also, as indicated above, it is assumed that 40% of the generated carbon credits will be placed in a risk buffer (not to be transacted).

Furthermore, past experiences indicate that the instability of forestry institutional frameworks could also be a source of risk. Therefore, structural provisions for the handing over of key responsibilities in the event of institutional reorganizations should be carefully considered.

9. Early experiences

Experiences so far show that PFM implemented jointly by community-based organizations and the government forest agency is a viable tool for reversing historical deforestation trends in

Ethiopia and therefore should be adopted as the main approach in implementing REDD.

Carbon revenues should be considered as one of the several possible incomes that PFM would help to bring about. Communities can benefit from forest product and service businesses based on sustainable forest management. Co-benefits beyond emission reductions, such as biodiversity, poverty alleviation and livelihood diversification, are also important because they can attract buyers and help the carbon credits obtain a premium price in the voluntary carbon markets.

Conflicts related to equitable sharing may arise in connection with the new benefits not only among participating stakeholders, but also among the heterogeneity community members. It is therefore crucial to look into the issue right from the start to guarantee the successful implementation of the REDD scheme through the clarification of rights and effective law enforcement.

The implementation of REDD benefits greatly from the knowledge and experience of conservation and development organizations, but business expertise is also required. With high upfront costs, price risks and delayed financial returns, business expertise can help manage REDD project risks. Also, given the evolution of a design for an international REDD+ mechanism, the expected financing support for REDD projects will also change. Project developers should be aware of international developments to ensure that they can create and realize value from their project activities (Watson, 2010).

It is also necessary to manage the expectations of REDD project stakeholders (communities as well as government) in light of delays between project activities and returns on investments. The fact that payments are based on delivery means that there is a lot of work to be done before the revenues actually start to come in. Therefore, a long-term stakeholder commitment is necessary, given the complex nature of the project.

10. Conclusions

The Bale REDD project is in the early stages of project development. As the project evolves, one of its key components is incorporating and accommodating the diverse stakeholder needs. If these needs can be met, the project could bring in the much needed finance to conserve the forests of the Bale Mountains and maintain their environmental services, which support the livelihoods of millions. Moreover, in addition to the reduction of greenhouse gas emissions, the REDD project has the potential to generate substantial co-benefits, such as positive impacts on biodiversity, poverty reduction and the strengthening of local community rights.

The revenues from a PFM-driven REDD can contribute to a new source of sustainable revenues for the government and also serve as incentives for concerned communities to enable strong support for sustainable forest management.

With regard to building REDD readiness for a post-2012 climate-change regime, Ethiopia is in the process of preparing its national REDD strategy. National REDD strategies must take into account a wide range of policies and national circumstances, including the drivers of deforestation, previous experience with forest conservation policies, cross-sectoral synergies, conflicts, rights, governance and administrative capacity. Building readiness for REDD ensures that an enabling environment is created for REDD activity implementation by different stakeholders.

As the potentials of PFM for the implementation of REDD+ is widely recognized, the Bale REDD project will serve as a pilot creating experiences for the upcoming implementation of the national REDD+ strategy and targets.

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Communities Reorganization for REDD+ Implementation in Zambia

Abstract
Establishing a global mechanism for reduced emissions from deforestation and degradation (REDD+) has now become part of the global climate-change negotiations. Proposals put forward for such a mechanism are intended to enable developing countries to maintain and manage forest stocks in return for financial support through carbon trading. Expansive forests in Africa facing serious deforestation and degradation threat are under community management. Such communities stand to benefit if enabling frameworks for carbon trading are put in place. Current governance systems are wanting, and the role of the state in future carbon markets is unclear. Approaches to forest management at the national and community levels must be changed if communities are to benefit from REDD+ driven markets. Using Zambia as a case study, a framework through which communities can benefit from REDD+ is presented. The community-based natural resources management approach is presented as the best way to enable community reorganization and entry into carbon and forest products markets.

1. Introduction

Between 2000 and 2005, Zambia's economy did remarkably well in posting an average growth rate of 4.8% per annum, much of which was based on natural resources, especially minerals (Pope, 2006). However these gains have not gone to the rest of the population. According to the World Bank, 68% of Zambia's population lives on under $1.25 per day (World Bank, 2008). This is largely due to resource constraints, poverty traps, weak policies, poor governance systems and poor development planning, which characterise many Sub-Saharan Africa (SSA) countries. In addition, and despite the decentralization policy of the Zambian government, there is an evident failure to prioritise and promote the devolved management of resources or the harmonization of cross-sectoral policy and legislation that affects the management of land and natural resources. In addressing rural poverty in Zambia, one option that has been missed is the natural linkage between people and forests.

Zambia's national development indicates that forests and forest industries contribute at least 3.7 percent to GDP, with the largest contribution coming from woodfuel.[1] The most significant contribution from the forest sub-sector is the provision of energy for the agricultural and domestic needs of 90 percent of the Zambian population (GRZ, 2006). The contribution that natural products make to rural livelihoods is critical. The 2003 Living Conditions Monitoring Survey (LCMS) shows that at least 25% of all female-headed households rely on these products to meet basic food and other household needs in times of stress. In addition, those Zambian households that are locked into chronic poverty also rely on wild fruits, vegetables and other natural products to meet their livelihood requirements (CSO, 2003). It is therefore not surprising that the role of the forestry sector, especially in local livelihoods, was recognized in Zambian's Fifth National Development Plan (GRZ, 2006); but this recognition was not accompanied by the necessary strategic and financial support to raise the profile and contribution of this sector to poverty reduction. The opportunity to appreciate this role fully may be lost, as forests in Zambia are under increasing pressure from agricultural expansion, infrastructural development and human settlement.

Most countries that have promoted Community Forest Management (CFM) have failed into achieve sustainable forest management or recognize the role of forests in rural people's livelihood.

Zambia's forest estate is estimated at 425,000 km^2 (57.1%) of the country's land area or 0.036 km^2 (i.e. 3.6 ha) of forest per capita, meaning that Zambia is often considered one of the most highly forested countries in the southern African region (FAO, 2009). In comparison, forest land ownership per capita for Malawi (2.6 km^2), Zimbabwe (13 km^2) and Mozambique (10 km^2) is significantly higher than that in Zambia (WDI, 2005). Zambia's protected forest reserves occupy about 9 percent of its total land area and forests in national parks another 9 percent, with 82 percent of the forests on customary lands under the jurisdiction of traditional chiefs who are responsible for their management (Kalinda et al., 2008; Njovu, 2004). Yet this endowment is under threat, as between 2000 and 2005 Zambia lost at least 4,450 km^2 of forests per year (FAO, 2009). These losses put Zambia among the ten countries with the highest annual deforestation rates.

2. Forest Ownership and Management in Zambia

The 1973 Forest Act and the forest policy of 1998 vest ownership of all forests in the President on behalf of Zambia's citizens (GRZ, 1973, 1998). The act establishes a Forestry Department as the authority to manage the country's forests. Forests outside protected areas are under the control of the Commissioner of Lands (under the Land Act of 1995), local and municipal councils and traditional leaders and constitute 82 percent of Zambia's total forest cover (Jumbe et al., 2009). The majority of forest is not under formal forest management and is therefore vulnerable to overuse, conversion and loss from increased demand for land and forest products from the growing population and associated economic activities. One aspect of the history of forest management in Zambia is the failure to put in place policies to foster the involvement of communities in this sec-

1 Woodfuel as used here refers to charcoal and firewood.

tor. The 1998 forest policy covered this gap, but the critical subsidiary legislation, the Forest Act of 1999, which provided for community participation in forest management, never became law. Phiri (2009) noted that the continued failure to involve communities may have been a key reason why the Zambia Forestry Action Programme had to be launched to increase community involvement in forest management. To do this, however, a special statutory instrument (SI 56 of 1999) had to be put in place (GRZ, 1998; 1999b).

Between 2000 and 2005, the government transferred over 2,000 km^2 (200,000 hectares) of forest to eight state-owned and two community-owned forests under a Joint Forest Management (JFM) scheme. This approach involved communities in the management of gazetted forests, as well as sharing the benefits derived from such collaboration (Barnes 2010). As in Tanzania, Kenya, Morocco, Mali, Nigeria, Sudan and Mali, Zambia attempted to shift from traditional state control of forest resources. This came with changes in policy and legal frameworks and was driven in part by the need to curb the rising deforestation rates (Alden-Wily, 2004). Most countries that have promoted JFM, Community Forest Management (CFM) or any other forms of participatory forest management have cited the failure of centralized systems of forest management to achieve sustainable forest management or recognize the role of forests in rural people's livelihoods. Bwalya (2004) attributes this shift in Zambia to the fact that the centralized, top-down approach to natural resource management (NRM) failed to arrest the irretrievable losses of biodiversity from the colonial and post-independence periods and made it necessary to change the NRM regimes. Furthermore, the shift was influenced by international calls for the decentralization of forest management, rather than building capacity in communities in the direction of self-governance in forest management (Ribot 2003; Ribot et al., 2008). While these management efforts have been implemented since the early 1970s in sub-Saharan Africa, many were supported from external donor resources and could not be sustained as neither the participating communities nor the state had resources dedicated to such developments.

In a study to evaluate the performance of the JFM programme in Zambia's Dambwa forest reserve, Phiri (2009) established that only a small number (8%) of local people reported an improvement in the socio-economic conditions of their households after the introduction of JFM. The same report shows that 79% of the people involved in the survey perceived the Forestry Department as the major beneficiary from JFM. The study revealed that there was a loss of enthusiasm for JFM among local people largely because they did not receive any tangible economic benefits form this initiative and had limited decision-making powers (Phiri, 2009). Similar results were noted by Bwalya (2007) in a study of another JFM site, Katanino. Those living around the Dambwa forest reserve may have failed to benefit from JFM because neither the SI 52 of 1999 nor the Forest Act of 1973 provided for clear community benefits from forests (GRZ, 1999). Further, as noted by Campbell et al. (2007), the economic opportunities of dry forests and their productivity are limited and therefore affected the range of possible benefits. While under JFM the communities involved did not receive any benefits because of a flawed piece of legislation, it is important that future processes and initiatives such as REDD+ should widen the incentive base beyond traditional products such as woodfuel. The new packages should encourage value addition as well payment for ecological services, including water catchments, carbon storage and sequestration, as a long-term strategy and

contribute to poverty alleviation. Some of these issues can be addressed under REDD+.

3. Models for Participatory Forest Management

Schreckenberg et al., (2006) cites the FAO definition of participatory forest management (PFM) as processes and mechanisms that enable those people who have a direct stake in forest resources to be part of decision-making in all aspects of forest management, from managing resources to formulating and implementing institutional frameworks. More specifically, community forestry refers to an aspect of participatory forestry that emphasises local communities as key stakeholders for sustainability. Various forms of PFM have been implemented in African countries since the 1970s. The approach has taken the broad forms of community forest management (CFM) in community-owned forests and joint forest management (JFM) in state-owned forests (Pofenberger and McGean, 1996). In Zambia, JFM was piloted in an attempt to bring state-owned forest resources under sustainable management, thus reducing deforestation while providing economic incentives to participating local communities through benefit sharing.

The scenario in these approaches shows that participatory forest management can denote different relations between forest management and community involvement in different countries, possibly varying from a token notion of participation to a full role in decision-making. The constructs of PFM in Africa range from full community ownership over forests to small, organised forest-user groups and top-down 'community' structures imposed on traditional user groups by intervention agencies, including state forestry departments and NGOs (Odera, 2004). In these approaches, attempts are made to devolve authority to local communities in anticipation of a cost-effective means of halting deforestation through locally prescribed management plans mainly to regulate harvesting. While aiming at sustainable forest management, the models of participatory forest management have focused notably on curbing illegal resource use, encroachment and forest fires (Skutsch, 2009) and to some extent provide access rights to state-controlled forests for local communities.

4. From Participatory Forest Management to Community-Based Natural Resources Management

In past decades, Zambia has mainly followed the centralized natural resource management approach, forests included. In 1988, Zambia implemented the Administrative Management Design (ADMADE), ushering in a shift from the centralized management of wildlife resources to Community-Based Natural Resource Management (CBNRM). From then on a shift was noted in the forestry sector towards Community-Based Natural Resource Management (CBNRM), which are more devolved models of participatory forest management. The shift started by pioneering JFM, as mentioned in the sections above. CBNRM is viewed simply as management of local natural resources that brings local benefits (Adams and Hulme, 2001; Murphree, 1991). The central premise is that community benefits and control lead to more sustainable natural resource management, as locally accountable institutions for natural resource use and management are strengthened, and local resource-user groups make better decisions about the use of land and resources (Ribot, 2002). Where forests are concerned, this entails the transfer of authority over forest resources to the local communities under

whose jurisdiction a given forest falls (Alden-Wily, 2004; Pofenberger and McGean, 1996). Potentially valuable resources such as timber, NTFPs and carbon associated with that forest are incorporated into a benefit package. Because CBNRM involves the transfer of authority over natural resources to local communities, it often produces major institutional reforms and fundamental changes in power (Jones 2004; Litvack et al., 1998; Andersson 2006). It is accepted that these models mean different things to different people, but in southern Africa CBNRM is most clearly defined in terms of the devolution of rights to make management decisions and capture benefits in relation to resources located on communal lands (Jones, B.T.B. and Murphree, M.W., 2004; Campbell et. al., 2002; Murphree, 1991).

Through CBNRM, more sustainable natural-resource governance regimes that enhance local economic benefits can be realised (Ribot, 2003). By re-crafting existing community-based organisations for the management of forests, immediate opportunities for establishing pilot projects for Reducing Emissions from Deforestation and Degradation (REDD) can be realised (Peskett, 2008). This can provide valuable lessons for any planned international finance mechanisms linked to the UNFCCC. Under CBNRM, communities not only focus on forests for timber, charcoal, fuel wood and NTFPs, but take a broader perspective of the value of the forest, including ecological services such as carbon capture, sequestration and ecotourism. As Agrawal and Ribot observe (1999), local communities are more empowered to make decisions and are able to designate community-forested land to various uses. Furthermore, the local-level institutions responsible for such changes are downwardly accountable (Ribot 2001). In Zambia, the history of community involvement and the impact of revenue distribution on community attitudes have had lasting effects, most strikingly the impact of the combination of tangible and transformational benefits which led to notable changes in positive attitudes towards wildlife conservation (Dalal-Clayton and Child 2003). This attitudinal shift lays the social foundation for later progress in the uptake of responsibility for resource management by communities, especially in the forest sector. This model of sustainable forest management therefore presents a worthwhile opportunity for building on REDD+.

5. REDD+, Carbon Trading and Payment for Ecological Services

Since 2007, parties to the UNFCCC have been considering a new policy and framework for Reduced Emission from Deforestation and forest Degradation (REDD+), which is being conceived as a two-pronged approach: first, by developed countries as a cost-effective means of reducing emissions; and secondly, by developing countries as a means of compensating local communities that have been historical custodians of the forest resource.

For Zambia, with REDD+ investment potential in 82% of the forests that are under community jurisdiction, the main challenge is whether local communities have adequate capacity to participate in carbon trading, which requires forests to be quantified and assessed, carbon credit prices negotiated and carbon stocks measured, reported and verified.

At its inception, carbon trading has predominantly been industrial based and has been through the regulated Clean Development Mechanism (CDM) in the recent past. The CDM Executive Board Report for 2009 indicates that, of the 1,899 CDM project activities registered globally, A/R accounts for only 0.43%. In Africa, very minimal carbon trading from small-scale afforestation and reforestation (A/R) projects has been implemented under the CDM (Jindal et al., 2006), and in Zambia only one project has been approved under this scheme (Chundama 2009a). It is not surprising that most countries that are implementing forest carbon projects have chosen to sell their carbon credits in the voluntary market. However, given the slow development of REDD+ discussions, the full potential for a REDD+ mechanism in contributing to mitigation efforts can be informed by a thorough analysis of existing projects.

For local communities in Zambia to participate in REDD+ markets, an effective national policy framework should be put in place by government through which the communities can access markets, negotiate and sell their carbon.

For a region such as Africa with an estimated 1.3 million hectares of forested land under various forms of community management (Odera, 2004), it becomes very important for a REDD+ mechanism to be established and provide payment for ecological services, as well as for lost development opportunities from direct use of forests (Peskett, 2008). The emerging carbon markets under REDD+ not only offer Zambia's rural communities an opportunity to diversify and increase their incomes from forest resources, they also offer the global community a cost-effective means to achieve climate change mitigation (Eliasch, 2008; Tavoni et al., 2007).

The Global Canopy Programme shows that the greatest mitigation potential in the forest sector is in developing countries. Of the 17 billion tonnes of emission reductions required by 2020, 70% is achievable in developing countries (GCP, 2009). It therefore follows that this potential has implication for the scale of carbon trading and thus offers increased opportunities for carbon trading in the forest sector. The current scenario shows that a larger amount, if not all, of carbon credits generated from REDD+ projects are traded in the Voluntary Carbon Market (VCM). For Zambia, with REDD+ investment potential in 82% of the forests that are under community jurisdiction, the main challenge is whether local communities have adequate capacity to participate in carbon trading, which requires forests to be quantified and assessed, carbon credit prices negotiated and carbon stocks measured, reported and verified.

6. Preparedness for REDD+ at community level

To harvest the benefits of international forest carbon finance, Zambia's rural communities must prepare for REDD+ implementation. Currently, from a global point of view, the United Nations REDD+ Initiative is fostering country preparedness for REDD+ to generate information, lessons and experiences. At the international level, the UN REDD Programme seeks to build consensus and knowledge about REDD+ and raise awareness about the importance of including a REDD+ mechanism in a

post-2012 climate-change agreement. It also provides opportunities for dialogue between governments, civil-society organizations and technical experts to ensure that REDD+ efforts are based on science and to take into account the views and needs of all stakeholders (UN-REDD Programme, 2010). While communities are expected to be involved in this process, as far as the REDD pilot in Zambia is concerned, it is notable that only the government is active. Thus, the agency's understanding of REDD+ is increasing, while that of communities and other players such as the private sector is not. Further, the capacities of communities living in and around the large expanse of forest in Zambia are low, which may severely limit the extent to which they can engage in REDD+.

This poses a big challenge for a national roll-out of REDD+ activities in forests outside protected areas, as engaging in REDD+ processes and the envisaged markets requires that all levels of forest resource management, from local communities via NGOs to national governments, share a common understanding and have enough capacities for effective engagement. For local communities in Zambia to participate in REDD+ markets, an effective national policy framework should be put in place by government through which the communities can access markets, negotiate and sell their carbon. The same framework must not only recognise the rights and responsibilities of the communities but also their limitations and ensure that the necessary safeguards are put in place. For example, rural communities cannot assess and negotiate with international companies as they neither have the skills nor the resources to do so. This is something that the governments will have to help with. In addition, the roles of district and other meso-level structures have to be clearly articulated, as must the facilitation roles of NGOs that may opt to assist rural communities. In this way, some forms of relationship will need to be established that link communities, government and REDD+ markets.

7. Community re-organization and forests zoning for REDD+

In the absence of the management regulation of forests outside protected forest areas, it is important that the Zambian rural communities under whose control such large amounts of forest exist should be better managed. For this to happen, the government must take the lead and create an enabling environment through which communities can trade in carbon. This may mean clearly articulated guidelines for carbon trade, indicating preparations to be done before a community can enter into this form of trade. Once the guidelines are in place and safeguards have been articulated, communities can then begin to organise to meet these requirements. Five developments are envisaged:

First, communities need to re-organize themselves beyond the existing centralising traditional structures based on chiefs and lineages into more legally recognized governance institutions that can mobilize the larger community population to get involved in forest management and REDD+. Under the Forests Act (1999), the Government of Zambia has made provision for the creation of Forest Management Committees (MTENR, 2008). This only applies to forests for which it is intended to implement JFM (GRZ 2006), though NGOs can organize communities with forest resources under their jurisdiction into such committees or boards that can provide forest management leadership. These structures could seek a legal identity through registration as trusts, based on experience of the JFM pilot (GRZ, 1999a);

Second, communities with facilitation from an NGO can identify and request a local chief to set aside land for purposes of establishing a community carbon reserve under REDD+. This set-aside will also go to the respective district council for

approval and to draw up guidelines for the management of such a piece of land. The necessary consultations will be carried out at the community level, and the users must agree to the proposed changes. The area will be surveyed, and through a resolution in a district council meeting the process of setting aside that piece of land for this specific purpose will begin. By-laws and rules of resource use within this area will be agreed, and the district council can apply to the Ministry of Local Government for an enactment of the by-laws. In Zambia, this is possible under the Lands Act of 1995 as well as the Forest Act of 1973, where a Minister responsible for the Act can set aside land for conservation purposes. The most critical element is that the by-laws will not necessarily exclude or bar people from using the forest, but they have to follow the rules in force in the particular zone in doing so (see below). The specially designated area will not be taken from the communal land, but will simply be managed differently. It is anticipated that issues pertaining to tenure, rights and responsibilities and the ownership of benefits derived from these, including carbon credits generated, will also be part of the bigger framework governing this venture.

Third, one of the centrepieces of this framework is capacity development for all the institutions and community groups involved. There is a need for these entities to advance their social and economic development while protecting their resources. The range of commitments that the community will be expected to carry out against the background of limited knowledge of forest management, illiteracy, poor understanding of trade, benefit-sharing and so on point to the need for an all-encompassing capacity-building programme to address leadership skills, negotiation skills and a general understanding of some technical issues pertaining to forest management and trade. General awareness of the project will be interspersed with more in-depth training for specialist groups such as beekeepers. This is an essential aspect of the proposed framework.
Fourth, perceptions of what is useful in the forest will vary by individual and area. Thus, a process of identifying the different uses and determining whether they are compatible or incompatible is crucial (see Figure 1 below). Carbon trade will call for changes in land use and opportunity costs, and hence the zoning of the forest has to be based on some criteria. In this paper we follow Chundama (2009). As already mentioned elsewhere in this report, Zambian rural households depend on forests for a number of products, and within communities some households are more forest-dependent than others and for different products (Mutamba 2007; Bwalya 2004; Jumbe et al. 2007). Also important is the timing of forest income (Arnold and Townson 1998), mostly at times when households have little else from other highly seasonal activities like cropping.

Land uses are either compatible (+) or incompatible (-) but can reinforce each other either negatively (-/-) or positively (+/-). Uses are compatible if they do not collectively lead to forest loss: for example, neither mushroom nor fruit collection leads to woodland loss. Other uses such as charcoaling and mushroom collection are incompatible, as the former leads to a loss of host trees. At another level, wood-carving and charcoaling are negatively mutually reinforcing in that, if found in single area, they combine and lead to a loss. In terms of carbon trade, the focus is on ensuring that leakages are minimised. Therefore, in those areas such as the core zone, where carbon is the major commodity, land use activities such as charcoaling and shifting cultivation will be strictly prohibited. Instead, collecting leafy vegetables, mushroom collecting and all other environmentally benign activities will be promoted (see Figure 1).

Figure 1. *Compatibility of timber and NTFPs forest products*

	Charcoal	Bamboo	Poles	Beekeeping	Carpentry	Medicines	Rattan	Timber	Firewood	Mushrooms	Fruits	Leafy veg	Caterpillars	Chitemene	Woodcarving	Spiritual and social	REDD
Charcoal	0	+	-	-	-/-	-	+	-/-	-/-	-	-	-	-	-/-	-/-	-	-
Bamboo		0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poles			0	-	-/-	-	+	-/-	+	-	-	-	-	-/-	-/-	-	-
Beekeeping				0	-	+	+	-	-	+	+	+	+/-	-	-	+	+
Carpentry					0	-	-	-/-	-/-	-	-	-	-	-/-	-/-	-	-
Medicines						0	+	-	-	-	+	+	-	-	-	+	+
Rattan							0	+	+	+	+	+	+	-	-	+	+
Timber								0	-/-	-	-	-	-	-/-	-/-	-	-
Firewood									0	-	-	-	-	-/-	-/-	-	-
Mushrooms										0	+	+	+	-	-	+	+
Fruits											0	+	-	-	-	-	+
Leafy veg												0	+/-	-	-	+	+/-
Caterpillars													0	-	-	-	+/-
Chitemene														0	-/-	+	+
Woodcarving															0	+	-
Spiritual and social																0	+/-
REDD																	0

Compatible land uses

Mutually reinforcing (positively)

Incompatible land uses

Mutually reinforcing (positively)

Source: Chundama (2009) and Gumbo and Chidumayo 2010

Fifth, through stock-taking of current uses and inventories, communities should be able to move to zonation of the identified forest. A particular forest could be zoned into 1) a core zone in which communities would implement exclusive provision of a holistic range of ecological products and services, including water catchments, ecotourism and carbon stocks; here communities would prioritize the products and services to harvested and promoted; 2) a buffer zone, which would permit the generation of carbon credits on assessed stocks, allowing for utilization for NTFPs such as beekeeping; and 3) an outer zone with assessed carbon stock levels, which would permit carbon credits and agroforestry practices that incorporate the establishment of woodlots to offset the demand for wood in the REDD+ forest. The underlying principle is that issues relating to the permanence of carbon stocks and the credits generated are assured in the core and buffer zones, while leakage is taken into account in the outer zone. The aspect of additionality in

this context is considered at the entire forest level. It is important that an explicit management plan guides the management interventions in the forests based on the zoned areas.

However, for local communities to re-organize and prepare themselves to participate effectively in REDD+ a combination of regulations and capacity-building efforts is essential.

In zoning a forest for carbon trade, the causes of change must be understood and harmonised and a management plan developed. For example, charcoal production involves the temporary or permanent removal of trees, causes leakage and thus cannot be carried out in the carbon trading zone. Shifting agriculture construction poles, commercial timber, firewood, carpentry and woodcarving will have the same effect. Generally, activities with a benign impact on the forest are the gathering of medicines, edible caterpillars, beekeeping, mushrooms, fruits and leafy vegetables, as most of these are actually gathered and do not require the removal of trees. Some of these activities, such as medicines and edible caterpillars, can also have a destructive impact if host trees are cut as part of the harvesting process. Conversely spiritual uses of forests to encourage standing trees will not result in leakage but promote permanence (Chundama 2009). Some forest uses can lead to losses of certain key tree species. In the absence of stipulations on selective cutting at the community level, such activities can lead to changes in tree diversity and a loss of carbon stocks.

Zoning means that there will be inflows coming from the forests. Revenue will come from three sources: first, from the local harvesting of forest products, for example, edible caterpillars as collected by the locally based entrepreneurs; secondly, from externally based collectors who pay fees to gather such materials in stipulated zones; and lastly, from carbon and other trade from outside entities. The need for transparency and accountability at all levels involved in the handling of revenue is critically important, and government must put in place a framework for revenue management. This means that the community must be prepared to pay the government for services rendered in respect of the administration of international payments for carbon. At community level, 'trusts' will be set up and will be responsible for the management of revenues at this level.

However, for local communities to re-organize and prepare themselves to participate effectively in REDD+ a combination of regulations and capacity-building efforts is essential. It is not enough for a community merely to participate in a REDD+ project when they do not have capacity to, for instance, contribute to the management plan of a forest. In the Zambian case, where large populations live either inside or on the periphery of the forests, it would not be practical to close them off or deny them access to the resource. Rather, communities need to put in place regulations that empower them to safeguard and ensure the sustainability of resources and associated products, including carbon credits. Where the potential for the generation of and trade in carbon credits exist and limiting access becomes critical, communities need to consider which economic incentives can be realised, including compensation for ecological benefits and advance payments for carbon credits, as the case may be.

8. Conclusion

Zambia has been involved in community-based natural resources management for a long time, but as things stand CBNRM cannot be used in the country's forest sector. As noted above, the present legal framework for the sector cannot sufficiently deal with issues of devolution that are central to the successful adoption and use of the CBRNM approach in this sector. At present, the control and management of forests cannot legally be devolved to local communities, as the law is still ambiguous on this issue. With pro-community involvement in forest management and the Forest Act of 1999 both failing to bring about the expected change, there is a need either to hasten the enactment of this piece of legislation or to formulate a statutory instrument that can be approved by the Minister of Tourism, Environment and Natural Resources (Natural Resources Consultative Forum, 2005). It is important that meaningful participation and democracy in decision-making is engendered at the lowest level in Zambia, making it possible for the community to make major decisions itself rather than depend on central government directives. There is the potential to piggy-back the management of carbon and the disbursement of REDD revenues to the poor through these structures. What is important is that there is a significant change in the enabling legislation, for example, the Local Government Act for Area Development Committees (ADC), as well as the requisite training.

In addition, other robust local-level institutional arrangements, such as trusts and societies, would need to be formed at the community level. Most of them are already provided for under Zambian law, for example, the Societies Act. Upon incorporation, such entities would obtain a mandate to manage a 'carbon concession' on behalf of a community and establish rules for entry and access to concessions where they are in place. The benefits accruing would be shared according to a negotiated framework. The critical issue here is to define who is a member of the community and also how this entity would link with government and the private sector.

This paper has shown that a large forest-resource base is still available in Zambia to support a national REDD programme. CBNRM and JFM initiatives have been tested in the country to draw lessons for community organization and preparedness for an effective engagement in REDD+. It can be deduced that, while the global community is establishing a mechanism for REDD+, caution should be exercised not to leave community capacity-building to the last minute. It is an acknowledged fact that Zambian communities with forests have been custodians of this resource for years, as they have drawn their survival and livelihoods from it. Therefore, while opportunities for deriving benefits from the resource exist, communities should be assisted to re-organize and effectively take the lead in issues of forest management.

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Preparing Community Forestry for REDD+:

Engaging Local Communities in the Mapping and MRV Requirements of REDD+

Abstract
Based on fieldwork carried out over the last five years, this article presents the case for communities being permitted to make their own forest carbon inventories for the purposes of monitoring under national REDD+ programmes, following brief training. Modern technology, particularly PDAs (small, handheld computers), can provide the platform both for mapping and for storing data, and can easily be used by people with only a few years primary education, although a technical agency will be needed to back up such systems. There are many advantages to this approach: costs are much lower than when professionals do the work, while the data are equally accurate. 'Ownership´ of the data may be important in legitimising communities´ claims to carbon credits in the forests they manage.

1. Introduction

In her plenary speech on Forest Day 3, 13th December 2009, during UNFCCC COP 15 in Copenhagen, Elinor Ostrom highlighted the importance of creating clear local livelihood incentives to ensure the sustainable management of forests and woodland resources. Citing meta-analysis studies – for example, that by Chhatre and Agrawal (2009) – Ostrom noted that the local monitoring, management and control of forest and woodland resources create a sense of local ownership and value in forests that is crucial to their long-term acceptance and sustainability.

In this article, we argue the case for communities to monitor those forest lands with which they are already engaged through their own

direct management for the sake of valorising the carbon services provided. Such a strategy should be valuable in national REDD+ programmes within forests under community control, although the strategy has less relevance for forests which are being logged or degraded by external public or private entities. We explore the notion of community-based forest carbon monitoring (CBFCM) as a means of creating local employment opportunities and local values in forests. We first focus on the ability of CBFCM to meet project- and national-scale monitoring, reporting and verification (MRV) requirements in REDD+. Our material and evidence for these skills is based on field research undertaken by the authors during the last five years in Africa and in Asia. Then a comparison is made of the advantages and disadvantages of forest monitoring undertaken by local residents as compared to external consultants, also based on field measurements. We conclude by discussing the livelihood benefits and skills-development opportunities created through CBFCM, as well as its potential to reduce the transaction costs of carbon forestry as a climate change mitigation and adaptation option.

The aim is to provide a practical assessment of the capacities of communities to become involved in MRV, and to propose recommendations to develop these capacities. Equally important, we look at the potential benefits for communities, and what real interest communities themselves might have in involvement in MRV for REDD+.

1.1 Objective

The objective of this paper is to review the experiences of local community people's involvement in MRV-type activities in REDD+ projects, or in community carbon forestry in general. There are not as yet many examples of communities being actively involved in REDD+ MRV, so we refer also to experiences and findings from other community carbon forestry initiatives or 'traditional' community forestry projects.

The aim is to provide a practical assessment of the capacities of communities to become involved in MRV, and to propose recommendations to develop these capacities. Equally important, we look at the potential benefits for communities, and what real interest communities themselves might have in involvement in MRV for REDD+.

1.2 Context: what are the likely future scenarios of REDD+?

Although there is still much uncertainty about the form REDD+ will take, in this paper we assume it will be implemented at the sector level across whole countries, or (for large or physically disjointed countries) sectorally across major administrative regions, rather than consist of individual projects as in the CDM process. The technical reason for this is to avoid leakage from treated areas to untreated areas, but there are political reasons too. Only 14 forestry CDM projects have been approved to date by the UNFCCC, partly because of the difficult conditionalities imposed. Current negotiations at the UNFCCC level indicate that many countries prefer to treat REDD+ as a national programme rather than as piecemeal projects carried out by project developers. This is demonstrated by the 35 national REDD Readiness proposals submitted to the World Bank's Forest Carbon Partnership

Facility and the 28 submitted to the UN-REDD programme. These documents, which result from participatory processes in each country, are all committed to the national REDD approach, although, given the difficulties of start-ups on a national scale, a likely scenario is that programmes would begin with individual pilot projects.

This paper assumes that REDD+ will incorporate measures for enhancing removals of atmospheric carbon dioxide as well as reducing emissions. The detailed policy discussion on REDD+ at COP15 (UNFCCC, 2009) strongly suggest that incentives should be offered for emission reductions from lowered national deforestation and degradation rates, and also for increases in forest carbon stock (forest enhancement). In addition, there would be some kind of compensation for conservation of forest that is intact, although how these carbon savings will be rewarded is not clear (UNFCCC, 2009; RECOFTC, 2010).

Many of the national REDD Readiness proposals specify community forest management as a central component of their national plans to reduce deforestation and degradation and enhance forest growth. Many forest departments have recognised that community forest management is a cheap and relatively effective strategy for sustainable forest management, particularly in low-value forests, although local communities have rarely been able to protect forests of high timber value, which are subjected to stronger commercial forces. Many national REDD+ programmes therefore envisage a system of payments for carbon services in which communities would receive some financial or in-kind reward for positive changes in carbon stocks. This would be financed from a public purse filled by national level sale of international carbon credits.

Another uncertainty revolves around where the money for carbon credits will come from, and whether the carbon credits can be used for offset or not; in other words, whether there will be a carbon market or a carbon fund. However, from the point of view of developing countries this distinction may not be so important because the criteria, such as those for designing systems to monitor environmental integrity, and probably also for monitoring social equity, are likely to be equally restrictive under either approach. More important, though going beyond the scope of this paper, will be the size of the demand for credits, since this will determine the price at which carbon can be sold.

2. Information needs in REDD+

2.1 MRV (monitoring, reporting and verification) requirements under probable REDD+ scenarios

If REDD+ is run as a sectoral, national-level programme rather than at project level, it will create immediate difficulties for MRV, since what has to be measured includes not only the areas subject to special treatment under REDD+, but all forest areas within the national territory. Moreover, in the past individual REDD-like projects, whether financed in the voluntary carbon market or simply to combat deforestation as in PES (payment for environmental services) projects, have used different monitoring and reward systems. A national REDD+ programme would have to set standard procedures for both data-gathering and the payments, which will require additional major efforts in public administration. For example, the standards of forest inventory would have to be acceptable internationally. They may be required to follow procedures recommended by the IPCC in its Good Practice Guidance for LULUCF (IPCC, 2003), which provides protocols for calculating sample size based on a pilot inventory. It also proposes that a randomised system of permanent plots should be used.

Measurement of change in national forest area (to detect changing rates of deforestation) can be carried out reasonably easily and cheaply through remote sensing, but this will not be sufficient for REDD+. Quantifying the density of biomass (i.e. the level of the carbon stock) in different categories of forests is much more difficult, but it is essential firstly for estimating the stock in the forests, both remaining and lost, and secondly, also for claiming for reduced degradation, forest enhancement and sustainable forest management, for which the changes in biomass density must be measured accurately. In many countries the majority of losses and gains in forest carbon will be in these three categories, rather than through deforestation. Therefore the ability to gather reliable data on forest density change may be the key to countries' participation in REDD+. It is essential to find cheap, reliable methods for establishing rates of degradation and forest growth: this includes setting baselines or reference levels for these processes. The REDD+ concept is hardly concerned with changes in forest composition per se because it is the changes in carbon stock that count for valorisation, but obviously forest composition affects ecological quality, biodiversity, local forest services and thus local welfare, and therefore is a vital factor in overall national forest policies, as well as in community land-use decisions.

Different measurement methods produce data at different levels of accuracy (Tiers 1 to 3 in IPCC terms),[1] and it may be assumed that when a low level of accuracy is implied, a greater proportion of the estimated carbon savings will be discounted from the crediting on the principle of financial conservatism. A method which produces data of greater accuracy (i.e. small standard error) should in principle generate more confidence in the results, and hence leverage rewards in terms of eligibility for a higher proportion of the estimated carbon savings (Wise et al. 2009) For a national REDD programme this presents a trade-off between the additional costs of increased accuracy of estimates of changes in forest density and the financial benefits of the additional carbon credits that can be generated. The parameters for these calculations have not yet been defined, and the margins for conservatism have not been set, though experience from the Voluntary Carbon Standard (VCS) of using a percentage of the credits as insurance against the risks could be adapted for REDD+. It is very evident anyway that governments will look for methods that generate maximum accuracy at minimum cost.

1 Tier 1 estimates carbon stock using regional or even continental averages. Tier 2 uses averages from national secondary data in areas similar to the site under consideration. Tier 3 uses measurements made at the site itself.

2.2 Information and meta-data requirements at international level

REDD+ adds carbon sequestration through forest enhancement, sustainable management of forests and forest conservation to the avoidance of deforestation and degradation envisaged under REDD+. Protocols for REDD+ have yet to be developed, but to make claims internationally a Reference Emissions Level (REL) will have to be drawn up by each country and approved by an international body. As with baselines for CDM projects, it is likely that several methodologies will be made available to meet different circumstances. Countries wishing to claim for both reduced degradation and forest enhancement will have to provide credible RELs for this – no easy task, since few have much data on changing forest density over time. Since most forest departments currently lack enough skilled staff, additional technical assistants (government, NGO, or

private sector) are likely to be needed, who would have to be funded out of the sales of carbon credits. Countries must declare what monitoring methodologies they are using, as this is essential for transparency of metadata. Probably they will develop and implement their internal verification methodology, and independent, external verification will then be implemented. Table 1 sets out the likely requirements.

Table 1. *Capacities likely to be required for national REDD programmes*

Measurement of carbon	Site-level field data on carbon stock changes to indicate: • Reduced deforestation and degradation compared to local baseline (Reference Emissions Level, REL) • Increases in carbon stock sequestration/forest enhancement
Scales of functioning	• Measurement skills at community level • Capability to scale up to region and country • Accessible central database for uploading data from decentralised projects
Verification and certification	• Transparent and independent verification system • Information availability from independent sources • Leakage estimated and included
Management Capability	Leadership; participation, resource rules, and enforcement • At local levels • At national level
Acceptability	Acceptability to states, regions and local communities, of the management and participation rules
Externalities	Damaging effects to environment and society and e.g. equilty are dealt with to an acceptable degree

2.3 Information and meta-data likely to be required at national and community level

For communities to credit and register the carbon sequestered in their forest, two levels of accurate and geo-referenced information are required for REDD+. First, a meso or 'landscape' level that involves information at 'community' scale will be needed to establish the initial forest management scenario (year 0). The second level represents a more intensive collection of detailed plot-level information (biomass sample plots within management strata), and some at tree level. Accurate data on the size and location of every measurable tree and bush in sample plots are required for monitoring and to facilitate re-measurement in subsequent years (see Table 2).

Table 2. *Information for Community Forest Management and Carbon Sequestration*

Level 1: Spatial and other information for establishing the initial management scenario (year 0)
• Boundaries of the community, and of its forest areas which are intended for a carbon payments project. • Community's land claims, if necessary • Community Forestry Management Approaches, land-use plans • Location of activities contributing to forest degradation, such as illegal logging, grazing, marginal agriculture, illegal settlements • Location of areas potentially affected by hazards (e.g. fires, erosion, ecosystem degradation, flooding, strong winds) • Conflict areas (spatial information about competing land uses and boundaries)
Level 2: Information for forest biomass inventories (year 0 and later)
• Delimitation of forest ecotype strata (zones) • Location and geo-referencing of the sampling plots for measuring different carbon pools • Geo-referencing trees and other features for future location of the sample plots • Field measurement and storage of tree data: DBH (diameter at breast height), tree heights, species, status, etc. in databases

For communities, particularly in developing countries, finding most of the forest management information in Table 2 is not easy. Non-existence, unavailability or inadequacy of forest information, lack of technical knowhow, and deficient support from government institutions to produce or handle information are drawbacks commonly faced. Therefore, for measuring and monitoring their forest resources, communities are likely to be dependent on external professionals and technical assistants, whose services would claim a big share of any income from carbon payments.

2.3 Monitoring additional variables complementary to improved land management.

While assessing carbon stocks and fluxes is crucial to the MRV, it is only one of several components that will need to be measured in developing REDD+ activities. There are additional metrics to be monitored under the current project-scale standards, such as the VCS and the Climate, Community and Biodiversity Standard, and these are likely to be included in future national-scale REDD+ frameworks:

- Socio-economic information: documentation of stakeholders, social governance structures, household income, biomass energy use, food and cash crops production, and benefit flows,
- Quantification and explanation of land use and land-use change: understanding the nature of deforestation drivers so as to model deforestation scenarios and develop appropriate responses. Monitoring

changes in land-use types and accessibility (especially roads) is thus an additional requirement.

- Biodiversity: the majority of REDD verification standards currently require quantification of project effects on biodiversity, especially threatened species – hence the need for adequate assessment of biodiversity, including in the forest surroundings.

3. The capacity and potential of community-based forest monitoring to meet information needs

3.1 Comparative advantages and benefits of community-based monitoring

Required skill-sets and expertise

Most activities related to carbon monitoring are regarded as technically highly demanding and therefore in the realm of professionals. However, experiences in Africa and Asia show that, with adequate training, key activities such as forest inventories, assessing and measuring forest resources, tree measuring and quantification of the current carbon stock and changes can be carried out by local residents, as demonstrated in the K:TGAL programme[2] (Skutsch, ed. 2010).

Under K:TGAL, a 'participatory geographical information system (PGIS)' was implemented in which local communities became conversant with the use of IT for carbon forest data capturing and geo-referencing. When trained, local people were able to map forest reserves rapidly and with precision, locate permanent sampling plots with accuracy, and record measurement data for trees and other vegetation in the plots. Local residents with a basic level of education could be trained in approximately two weeks to conduct surveys. If they have used cell phones before the work can proceed more quickly because of their similar handling characteristics to GPSs and handheld computers. A basic premise is that even people unfamiliar with computers (including the illiterate and innumerate) can learn to follow the inventory protocols used by professionals if suitable translation methodologies are developed and made available. Results in several tested areas were within the desired levels of precision and reliability of those produced by professionals (Box 1; Zahabu 2008; Skutsch (ed.) 2010).

2 The K:TGAL programme, which ran from 2003 to 2009, worked at 39 sites in 7 countries and trained communities to make their own forest inventories to assess carbon stock changes for the purposes of REDD+. The training manual developed by the project can be downloaded from www.communitycarbonforestry.org

Box 1. *Costs and reliability of community versus professional carbon-monitoring*

In the K:TGAL programme, costs of community measurements were made at several sites, including the costs of training by an intermediary organisation and a daily wage rate for the community members undertaking the forest inventory. These are compared with the costs of professionals at two sites. The variations in cost between communities reflect variations in the size of forests (considerable economies of scale), their accessibility (to the intermediary organisation) and their carbon productivity. As indicated in the following table, the costs of professional measurement appear to be at least double the costs for local measurement.

Location	Cost per hectare, community ($)	Cost per tonne carbon, community ($)	Cost per hectare, professional ($)	Cost per tonne, professional ($)
Nepal site 1	2.4	0.2		
Nepal site 2	4.7	1.5		
Nepal site 3	5.1	2.5		
Tanzania	3.1	2.3	10.0	7.4
Uttarakhand (India)	5.4	0.8	11.0	1.6
Papua New Guinea	3.8	0.4		

Comparing the results of professional and community inventories at the Tanzanian and Indian sites indicates that the two sets of estimates are similarly reliable; there were no statistically significant differences in their estimates of mean biomass.

Both the professionals and the communities measured diameter at breast height and tree height, identified the species and applied the relevant allometric equations to reach the estimate of above ground woody biomass (from Skutsch ed. 2010).

Interest in CBFCM has encouraged the emergence of new techniques and technologies to improve the collection of data. Hand-held electronic data-entry hardware (PDAs) and software products developed as field survey equipment are being applied to CBFCM to reduce sampling error and loss of data. The hardware unit, typically including a GPS receiver, records location and vegetation metrics in predefined fields to improve data quality and completeness. The data are then uploaded into a database system that automatically verifies them and flags potentially incorrect values for the attention of the field team. The Tropical Ecology Assessment and Monitoring Network (www.teamnetwork.org) is an example. Data are either uploaded from a PDA unit or entered into a predefined spreadsheet. Data are systematically backed-up, and additional analysis can be performed immediately.

Local people often have a good basic knowledge of local tree species, the distribution of spe-

cies and forest products, and an understanding of the local ecology. Moreover, residents have a good understanding of local logistics of access, permissions, role players and the local and traditional authorities. In comparison, external consultants have to go through lengthy introduction and permission processes, as it is usually frowned upon simply to start surveying on communal or private lands. Permissions can absorb much valuable time, and even then local residents are often suspicious of outsiders. External consultants therefore require a local facilitator to manage logistics, deal with permissions and communicate with local residents. Knowledge of local languages and traditional structures is especially advantageous in monitoring the non-carbon metrics. Stakeholder engagement and the monitoring of socio-economic metrics take considerable care and time, requiring frequent engagements with individuals and groups. In such cases, external consultants may be prohibitively expensive as well as impractical.

Cost efficiency

The financial viability of REDD ventures relies on cost-efficient monitoring of carbon stocks across landscapes. While technological advances allow deforestation to be measured with a reasonably high level of accuracy through satellite-borne sensors, experiences in assessing carbon stocks in the tropical forests of the eastern DRC and Miombo woodlands of Zambia indicate that the cost of the advanced imagery and processing is often more than the monetary value of the change in carbon stocks.

Relatively inexpensive remote sensing data such as MODIS or LANDSAT imagery have been used until now to assess forest cover for REDD projects. Although significant progress has been made in the processing and analysis of MODIS and LANDSAT data, intensive ground-truthing is still required to estimate carbon stocks to an adequate level of certainty, as well as to verify land-uses changes such as food and cash-crop farming, pasture, roads and exotic plantations (Trodd and Dougill 1998). In addition, the ground-truthing is required over vast, inaccessible areas demanding lengthy investments of time. Empowering local people to undertake such monitoring, as opposed to external consultants, saves significant costs and maybe also time when the additional flights, local mobility and accommodation for external consultants are factored in.

Concerning the precision of carbon estimates, there is always the possibility of sampling errors creeping in, whether residents or consultants undertake them. While monitoring effort should be proportional to the improvement in the certainty of the estimate (Wise et al. 2009), based on the central limit theorem, it is generally prudent to invest in increasing the number of replicates (plot measurements) per stratum rather than the accuracy of each sample in order to increase the precision per unit cost. The number of replicates is key, not necessarily the accuracy of each replicate. Since local wages for field staff are typically a fraction of external consultant costs, by incorporating local people it is economically feasible to undertake many more replicates in each stratum, thereby reducing the variance in the carbon estimates of each stratum. This is often crucial to project financial viability, especially in woodland and savanna systems (Wise et al. 2009) (Box 1). Moreover, if communities take the measurements themselves, measurements could be taken annually, which would increase reliability by increasing the number of replicates and by allowing a trend line to be established within the crediting period, rather than just at each end of the period..

Required capacity for national-scale REDD+

In practical terms of capacity, there may not be enough external consultants to undertake all the carbon, socio-economic and biodiversity surveys required for national REDD+ initiatives (Burgess et al. 2010). The few consultants available are in high demand and charge high fees. Although monitoring procedures, techniques and technologies are becoming more efficient, it will require a vast number of monitors to cover all the metrics across all countries entering REDD+. Moreover, it is proposed that REDD projects have a lifespan of at least twenty years. The Noell Kempff Mercado Project in Bolivia, for example, is planned for 99 years, and forest monitoring and verification need to cover the project lifespan. A system based on external consultants is likely to be financially unviable under REDD+, which is an important rationale for local residents to undertake the monitoring, using external consultants only for the necessary third party independent verification.

In countries with entrenched bureaucratic governance, officials may balk at handing over a function to local residents that is traditionally seen as a government responsibility and prerogative. Moreover, currently some REDD+ projects are being developed by external NGOs that are unfamiliar with local government structures. This can result in important actors being left out of the development and officials feeling alienated and not buying into the CBFCM concept.

Table 3. *Comparison of monitoring components undertaken by external consultants and by teams from the local community*

Monitoring component	External Consultants	Local Community Residents
Cost	High professional fees, travel and accommodation costs	High initial set-up and training costs followed by substantially lower salary, travel, accommodation costs over time
Local knowledge	Usually poor. Local guides and translators usually needed	Good. Residents typically know the area well in terms of access, logistics, local authorities, laws, and species names
Data quality	Good	Good, but dependent on appropriate training and data verification
Consistency	Potentially low if same consultants cannot continue with monitoring over lifespan of project	Potentially high if same team members or at least the same coordinators can be maintained
Intensity	Usually low. Too costly to spend long periods in field.	Good. Even if sampling is done part-time, substantial travel and set-up time is saved
Value addition	Low. Usually limited to technical input and PDD compilation	High. Project success depends on local resource users. Monitoring by locals creates ownership.
Spin-offs	Maybe for consultants' business, not for community.	Participation adds to the skills levels and capacity of local residents. Possible spin-offs to other community PES activities
Management	Expected to be good	Potential area of concern in many communities.
Logistics	Consultants' flights, vehicles and accommodation costs are high. In remote areas, costs escalate when vehicles are needed.	If locally organised is cheaper and more appropriate, e.g. working by foot or animal can be effective because field surveys are spread over time.
Initial inputs, e.g. time	Low. Assumption is that professional teams need relatively little preparation time	High. Takes more time to identify, train and equip teams
Collection of other important data, e.g. socio-economic information	Generally poor. Very challenging to understand local socio-economy and culture, time-consuming to collect the data.	Good. In-built knowledge of local economy and culture; easy to collect initial information and monitor changes

Where there is funding to contract-in external monitoring consultants, it is common practice in certain countries also to take on local officials to act as national facilitators. These posts are often paid at lucrative international rates. When local community monitoring is proposed in place of external consultants, some officials may be apprehensive that it could jeopardise future facilitation contracts.

Management of monitoring teams is a key issue. In remote areas people often do not have access to the internet, and there is limited accessibility. This means it is often infeasible to remotely manage monitoring teams from, say, the capital city or a foreign-based NGO. It is highly recommendable that teams have a permanent local manager, especially a CBO or local NGO, who can be readily contacted for reporting and who will deal with technical matters.

Resistance to monitoring by the communities who are managing their forests may also come from people within the community who may view it as restricting their use of natural resources. To avoid this, the REDD+ process needs to be open and transparent right from the outset through a process of public participation. However, this in itself will not ensure long-term buy-in from local residents. Community-based participatory projects by governments and NGOs are common today in rural areas, and there is often increasing reluctance by local people to become involved. Participation is time-consuming, and more importantly these projects have often brought no real, lasting benefits. These realities are frequently observed by development practitioners, but not so often recorded (though see, e.g., Hickey and Mohan 2004). For REDD+ to succeed, there have to be long-term financial, material and empowerment benefits for local residents. Employing community residents as monitors is one way of achieving this.

4. Creating value in forests for local communities through implementing carbon projects

Creating rural employment opportunities and income flows

A key component of the long-term acceptance and sustainability of REDD+ initiatives is the creation of a sense of local ownership and value in intact forest and woodland systems (Chhatre and Agrawal 2009). Moreover, income flows and value added by REDD+ activities need to be greater than the foregone opportunity costs of deforesting or degrading the area for timber, charcoal, livestock or agriculture.

Clear, substantive incentives, such as employment, direct cash incentives, sustainable livelihood opportunities and community development projects, are essential to ensure the appropriate management of forest resources over the long term. The authors' experiences in developing REDD activities in sub-Saharan Africa indicate that creating the incentives in the forms of employment and alternative livelihoods is particularly challenging in remote rural areas where access to communications, and especially to markets, is limited.

The sound forest management practices needed for REDD+ sustainability demand much labour from the community, for fire prevention, livestock grazing controls, water and soil erosion management, defence against illegal felling and encroachments, and so on. The PES model assumes that the real costs of this local employment are accounted for

and compensated within the carbon payment levels. Furthermore, the carbon monitoring itself presents an additional opportunity to create employment and income flows. While the monitoring only takes a portion of the year, the trained team can also be involved in surveillance, fire control and other management tasks.

Local skills development and creating the human and institutional capacity needed for national scale REDD+ implementation

In impoverished rural areas, formal educational levels are low, thus training people as REDD+ monitors adds a set of life skills that potentially spill over to other spheres. The involvement can lead to social and institutional strengthening in the community. There is not only an expanded understanding of local natural resource management and values, but the skills such as data capture and mapping empower people and bring at least some of them into decision-making processes. When the skills are developed and retained or passed on to others and new technical knowledge is acquired, then, importantly, the ability to deal with powerful government agencies, NGOs and commercial capital is greatly strengthened. There is great potential for utilising the participatory survey and mapping skills for other community purposes, such as making land claims, resolving land conflicts, collaborative land use planning, and applying for other PES finance such as hydrological or biodiversity services.

Ability to respond from an empowered, informed position to REDD+ developments

Currently, local communities have little say in REDD+ developments, due to their limited policy knowledge and lack of institutional support. Whilst participating in monitoring and mapping activities, residents can be learning about the functioning of climate change policy, REDD mechanisms and payments for climate change mitigation. This increased awareness would allow people to respond to national REDD+ agencies and the global carbon project developers from a more informed and confident position. Moreover, it should allow communities to engage with REDD+ initiatives if they wish, with 'free, prior and informed consent'.

Lower transaction costs are essential for the economic viability of community REDD+

The actual price of carbon credits will ultimately determine whether REDD+ activities are worthwhile or not for the country as a whole, as well as for communities that may participate. At this moment there is little information on what this price will be. However, it is clear that cost efficiency and reducing the transaction costs of crediting carbon will be crucial to achieving financial feasibility. Their importance is amplified where the volume of emission reduction units produced is relatively small, whether this is because of the small size of the management units or because the carbon stock growth rate is relatively low (Cacho et al. 2004). Thus, reducing monitoring costs is essential in small community projects in dry forest and savannah areas, for example, in the miombo woodlands of sub-Saharan Africa,

Community-based monitoring greatly reduces the transaction costs of monitoring and management, as the operational costs are a fraction of those of external professionals (Box 1). The key is to develop the protocols, mechanisms and associated training, so that community residents can perform monitoring and reporting with sufficient accuracy and reliability to be acceptable in a formal carbon finance mechanism.

5. Conclusions

Community management is currently being promoted in many national REDD+ programmes, but the full implications of the range of the data collection is not always considered. While changes in forest area (relating to deforestation) can be measured relatively accurately using remote sensing, the changes in forest density, related to reduced degradation and forest enhancement, must make use of decentralised field measurements. We have argued above that, for many reasons, communities that are already involved in the management of their forests should be empowered and mobilised to carry this out. Some authorities may view this idea with scepticism, but our and others' experiences show that, given a clear protocol and appropriate training, communities are able to gather data as accurately as professionals, and at a fraction of the cost.

The protocols used, such as those in the K:TGAL programme, need to be based on internationally accepted methodology to ensure confidence in the data, and independent verification will be essential. Detailed guides are available from various sources (Bhishma et al. 2010, Theron 2009, Verplanke and Zahabu, 2010; see also van Laake et al. 2009; Peters and McCall 2010)

´What is in it for communities?` This depends crucially on the financial margins that communities would receive as a result of their participation in REDD+ activities, and how these are distributed. At present it is very difficult to estimate either the market price of REDD+ carbon or the transaction costs that will be incurred in running the national programmes. These issues will become more visible as national programmes get started. In any case, we argue that the low cost and high effectiveness of community monitoring offers the hope that communities will one day be able to measure and sell credits for the increases in carbon in their forests as a form of livelihood diversification.

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The topic for the 2010 edition of the Perspectives is "Pathways for Implementing REDD+: Experiences from Carbon Markets and Communities". This year, the publication goes beyond opportunities afforded by the Clean Development Mechanism (CDM) and includes voluntary markets. It reflects the current experiences about implementing REDD+ activities at the project and community levels. Some of the articles presented discuss or propose ideas about how to create incentives to participate in REDD+, its implementation, and possible financing; how to involve the private sector; what are the experiences from the carbon markets, and how to engage communities in REDD+. The authors have been carefully selected to reflect a mix of different perspectives from the private sector, country negotiation teams, research institutions, and carbon market organizations. They share their insights and ideas on various important aspects and issues for the debates on a global REDD+ mechanism in the ongoing climate negotiations.

This new publication is targeted to a wide audience, including policy makers, country negotiators, research institutions, and other people interested in REDD+.

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