

WORKING PAPER

A New Opportunity to Help Mitigate Climate Change, Save Forests, and Reach Development Goals

Prepared for the United Nations Foundation

Prepared by the Nicholas Institute for Environmental Policy Solutions, Duke University

Lydia P. Olander
Brian C. Murray



NICHOLAS INSTITUTE
FOR ENVIRONMENTAL POLICY SOLUTIONS
DUKE UNIVERSITY

www.nicholas.duke.edu/institute

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Lydia P. Olander and Brian C. Murray
Nicholas Institute for Environmental Policy Solutions, Duke University

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A new opportunity to help mitigate climate change, save our forests, and reach our development goals

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Executive Summary

A new proposal by developing nations to include reducing emissions from deforestation (RED) in the United Nations Framework Convention on Climate Change (UNFCCC) is moving forward and could provide an unprecedented level of funding for forest conservation and development objectives. It has the potential to jointly address climate change, forest conservation, and development objectives.

This proposed policy, which also sometimes includes avoiding forest degradation (making it REDD), ties compensation for activities to preserve tropical forest cover with the reduction of greenhouse gas emissions from the atmosphere. Given the current rate of emissions from deforestation and even the moderate price that might be paid for reducing emissions under a program to credit actions to avoid it, the annual value of economic opportunities from reducing deforestation can reach into the tens of billions of dollars if the program is tied to the global carbon market (Table ES-1).

Table ES-1. Potential value of reduced emissions from deforestation on a carbon market price range of 15 – 30 US\$ per tonne of CO₂ based on estimates of current carbon dioxide (CO₂) emissions from tropical deforestation.

Pan-tropical forest nation activities	Stopped deforestation	Deforestation reduced 50%
billion tonnes CO ₂ emitted annually	3.6	1.9
US\$ value annually	\$53 - 106 billion	\$26 - 53 billion

In 2005 at the UNFCCC Conference of the Parties in Montreal, the Coalition for Rainforest Nations (CfRN) introduced a RED proposal, which was accepted for further discussion and has been moving forward steadily since. The proposal would allow non-annex 1 nations (those not already committed to national reductions under the UNFCCC, which are primarily developing countries) to receive compensation for avoided emissions from deforestation.

Currently neither the UNFCCC, nor the Kyoto Protocol (KP) has any provisions to allow non-Annex 1 countries to receive credit or payments for avoiding emissions from deforestation. The Clean Development Mechanism under the KP, allows projects for sequestration of emissions from afforestation and reforestation, but does not have any incentives for avoided deforestation.

The CfRN now includes 33 nations, most of which have significant tropical forest cover and many with high levels of deforestation. Brazil, the world's largest source of carbon emissions from deforestation is not part of the coalition; however, Brazil does agree with many important aspects of the proposed policy.

Features of the RED proposal

While there are a number of outstanding questions about its implementation and scope, there is general agreement among the nations that:

- Emissions from deforestation would be measured and compensated at the national level.
- Participation is voluntary.
- Participating countries must measure and report emissions from deforestation.
- Their reductions would be compensated only after they have been demonstrated.
- Developing (non-Annex 1) nations are compensated by developed (Annex 1) nations for reduced emissions.
- Finally, reductions of deforestation need to start soon, before the next Kyoto commitment period in 2013, if they are going to make a difference. Some certainty that early reductions will be compensated will help motivate private capital and accelerate action to preserve existing forests rapidly being lost to deforestation and degradation. Once the forest is gone, the opportunity to avoid emissions and to save the other services it provides (biodiversity, clean water, livelihoods, etc) is lost.

Questions about RED

The implementation of a RED policy still raises a number of questions about how the compensation would occur, what activities would be credited, and the structure of the policy as it relates to current UNFCCC policy.

Compensation Structure: Global Trading Market or Independent Fund? One of the most important questions still to be answered is whether RED credits would be compensated through the global emissions market, as proposed by the CfRN, or through a fund unrelated to the emission market. The money available for the latter would presumably require voluntarily contributions from developed countries and, based on experience to date with multilateral funding aimed at reducing deforestation, seems unlikely to provide anywhere near volume of funds possible through a market. If it is tied to the market, the trading platform and oversight mechanism will need to be determined.

Deciding the Scope: What Activities will be Eligible for Compensation? Another crucial issue is deciding the scope of the policy, such as whether to include degradation, and whether a complementary “Stabilization Fund” can be developed to support forests in countries with little or no deforestation currently, but who may be at risk of forest loss in the future. Table ES-2 outlines the types of policy features that might work best for countries with different forest and land use characteristics. If the program is limited to crediting reduced deforestation, then only those countries with significant deforestation rates would benefit. This would leave out numerous nations where forest degradation, managing and maintaining existing forests -- or, reforestation and afforestation -- are the nation’s only activities capable of affecting carbon emissions from land use, land use change and forestry. With a more exclusionary policy, drivers of deforestation (logging, agriculture) may shift to those countries not included, which would undermine the intended global benefits of climate and forest protection.

Table ES-2. Country characteristics and the forest activities they would like covered.

Country Characteristics	Example region	Policies that help (Activities Included)
	High rates of deforestation	
High rates of forest degradation that does not transition into deforestation	Congo Basin Countries	REDD Compensation also for reduced emissions from degradation
High forest cover with little or no deforestation.	Costa Rica	Stabilization Fund Compensation for conserving existing forest where deforestation is not occurring
High cover of managed forest with little or no deforestation or reforestation	India	FM in CDM Compensation for increased sequestration from improved forest management
High potential for afforestation and reforestation (AF/RF)	Brazil, China	CDM Clean Development Mechanism – compensation for sequestration in afforestation or reforestation

Measuring Emissions Reductions: The issue of how to measure emissions from deforestation has been discussed from the outset of deliberations on forests under the UNFCCC, since concerns over the difficulty in measuring deforestation emissions was one key factor that kept deforestation out of the initial climate agreements. The scientific consensus is that we now have or will soon have the tools, data, and methods necessary to measure deforestation emissions in most places. Measurement of emissions from deforestation should be broadly feasible as long as flexibility in measurement quality is built into the system.

Integrating with Existing Policy: An important question remains of how or whether the system will integrate with the Kyoto Protocol’s Clean Development Mechanism that credits afforestation and reforestation projects.

Impact on Sustainable Development and Local Livelihoods

If a RED program taps the market potential, national policies could direct substantial capital, substantially more than typical development assistance funding, toward sustainable development and local community economies. However, national level policies motivated by a RED system could also have negative impacts on local communities if not well-designed. A program that negatively impacts the livelihood of local populations is less likely to succeed. It is worth exploring ideas for averting the

negative outcome, such as, certified or labeled RED credits, a complementary social or environmental fund, or bundling with added value ecosystem services like biodiversity.

National Implementation: Assuring Reductions and Directing Compensation

While there are still a number of outstanding questions regarding the international structure of a RED policy, on-the-ground success of the program may rest more in the hands of the national governments. If nations are the responsible party for emission reductions and thereby receive the compensation, they are also responsible for implementing successful national policies that effectively maintain and increase reductions in deforestation. There are a number of policy ideas to accomplish this including private party payments, enforcing laws and property rights, and investing in efficiency improvements. Whether the ideas will be effective and provide social and environmental co-benefits is a crucial question for the countries and concerned constituencies in the development and environmental communities. Of the possible implementation policies, some have been used in the past, some are just being tried now, and some have yet to be tried. Pilot projects that are currently underway and those to be funded shortly through the World Bank can provide an important testing ground.

Conclusion and Recommendations

A RED policy has incredible promise for addressing threats from climate change, protecting forests, and enhancing economic and social welfare. But how the policy is structured and complemented by other programs and how it would be implemented at a national level can make or break it. To move a RED policy forward we recommend the following actions:

1. Support the continued development of a RED policy, whether through international negotiations or as a component of a domestic policy, that will be linked in some manner to the substantial capital that will be available through the global carbon market.
2. Push for more freely available remote-sensing data for monitoring and measurement of forests to allow countries to improve their forest measurement.
3. Promote funding and other assistance for: (a) building technical and institutional capacity, such as regionally coordinate centers for measurement and monitoring of land use change and emissions, data acquisition, technical training, and ideas and analysis for structuring national policies; and (b) Expansion of pilot projects.
4. Develop incentives to encourage early engagement of private capital.
5. Support coordinated conservation among countries that do not or cannot engage in RED. A forest stabilization fund may be necessary to combat international leakage - the shifting of emissions to countries that do not participate directly in the RED compensation policy. Cooperation among countries will be essential to reduce the transfer of logging and clearing for agriculture to other countries. Without more comprehensive forest coverage the RED program may have little overall benefit for forests or the climate.
6. Ensure that compensation for RED promotes the provision of other ecosystem services and local economic development, with standards that protect these other services and values and perhaps with private and public capital that can be used to incentivize these protective behaviors (i.e. biodiversity fund).

Introduction

The new climate agreements may offer an unprecedented opportunity to save forests and promote development

Forests play an important role in the global climate system through the regulation of carbon dioxide (CO₂), the most significant greenhouse gas (GHG). Forests can remove the CO₂ out of the atmosphere as they grow and store it as carbon in trees, soils, and harvested wood products but they also emit CO₂ when they are cut or burned. Deforestation accounts for around 20% of current global GHG emissions¹. Globally forests are a net source of GHG emissions, meaning emissions exceed removals and global forest carbon stocks are declining². However, in some regions, forests are a net “sink” of carbon, meaning that the amount of CO₂ they remove from the atmosphere exceeds the amount they emit.

The United Nations Framework Convention on Climate Change (UNFCCC) is in the process of negotiating the post-2012 phase of agreements. While the existing agreements (The Kyoto Protocol which covered commitments from 2008-2012) include forests in general emissions accounting for the developed (Annex 1³) countries and the Clean Development Mechanism can be used to promote sequestration through afforestation and reforestation in developing (non-Annex 1) countries, deforestation in developing countries – where most is occurring - remains outside the agreements. A new proposal to compensate developing countries for reduced emissions from deforestation (RED) was offered in 2005 at the Montreal UNFCCC Conference of the Parties (COP) by the Coalition for Rainforest Nations (CfRN)⁴ led by Papua New Guinea and Costa Rica and has been gaining substantial momentum over the last two years.

¹ IPCC 2007. Climate Change 2007: The Physical Science Basis: Summary for Policymakers
http://www.ipcc.ch/WG1_SPM_17Apr07.pdf

² See FAO, Global Forest Resource Assessment, 2005, Table 2-10 for estimates of decline in forest carbon biomass globally and by region. (<ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E03.pdf>)

³ Annex 1 Parties of the UNFCCC include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.– list of Annex 1 countries -
http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php

The Annex 1 countries, can include forests and land use in their country inventories and do so using comprehensive accounting of both storage (sequestration) and emissions. In many cases, the northern hemisphere countries that are party to the Protocol have enough carbon sequestration through forest regrowth to offset some of their fossil fuel emissions when meeting their Kyoto targets.

⁴ At the time of the proposal the coalition was made of up of 15 rainforest nations led by Papua New Guinea and Costa Rica. As of June 2007 there are 33 nations in this coalition.
<http://www.rainforestcoalition.org/eng/>

Inclusion of forests in the new and growing global greenhouse gas emissions trading market through adoption of a RED policy offers an unprecedented opportunity to finance forest conservation and expand social and economic development. Emissions trading allows parties that are covered by a GHG cap to meet their cap in part by either purchasing the right to emit (allowances) from other capped parties or to purchase “offset” allowances for net emission reductions from those outside the cap. If such a system allowed the inclusion of RED from uncapped (non-Annex 1) countries as a source of offset credits, this could provide a tremendous income opportunity for those countries⁵. With substantial capital flowing into a new and expanding carbon market and the growing desire of world leaders to finance avoided deforestation as a climate mitigation and development strategy (e.g., a new World Bank fund to initiate these efforts⁶), forests may for the first time⁷ receive sufficient compensation to more effectively compete with other uses of the land and put a significant dent in the pressure to deforest.

Given the current rate of emissions from deforestation and a greenhouse gas allowance price of 15-30 US\$ per tonne (Mg) of CO₂⁸, the annual value of emission reduction opportunities from reducing deforestation can reach into the tens of billions of dollars if it is tied to the carbon market (Table 1). This would be a substantial influx of capital into developing countries. For selected countries with high rates of deforestation that reduce their deforestation by 50%, a RED program tied to a carbon market could provide income that ranges from 0.2 percent up to as high as 5 percent of GDP (Table 2). A simplified analysis of the 8 nations with the highest deforestation rates estimates that a 50% reduction in deforestation would have an opportunity costs between 3 and 6 billion US\$ each year⁹, significantly less than tens of billions potentially available through a carbon market to offset these losses. So, even including the added costs of inefficiencies in implementation and administration, a moderate market price for carbon could provide sufficient compensation for the lost economic opportunities that can come from using forests.

⁵ N. Stern. (2007) *The Economics of Climate Change: The Stern Review* HM Treasury/Cabinet Office: CUP, Cambridge

⁶ <http://www.un.org/News/Press/docs/2007/envdev922.doc.htm>

⁷ Forest conservation and development assistance have traditionally been the work of government, non-governmental organizations and local communities working with limited budgets to stem the tide of forest loss and improve the livelihoods of local communities. As committed as these organizations are, the efforts have largely remained outside the economic system and thus undercapitalized. Recent efforts to expand forest conservation including economic and other social considerations, such as sustainable forestry certification, eco-tourism, and concession reform have had their successes, but to date they have not had a significant impact in reducing loss globally.

⁸ Emission allowances for the first year of the Kyoto Protocol, 2008, are currently (June 25, 2007) trading at approximately 21 euro or \$28 per ton of CO₂.

⁹ M. Grieg-Gran. 2006. *The cost of avoiding deforestation*. Report prepared for the Stern review of the economics of climate change. International Institute for Environmental Development. London

The process of saving forests is linked to progress on other development objectives. Efficient use of natural resources (improved forestry and agricultural activities) and providing incomes for forest communities and other social and development objectives are essential to successful reductions in forest loss. Catalyzing market opportunities for saving these forests, then, not only has the potential to resolve deforestation problems more effectively than other efforts to date, but promotes the broader social and economic objectives of the people who depend on forests for their livelihood and well-being.

Table 1. Potential value of reduced emissions from deforestation on a carbon market price range of 15 – 30 US\$ per tonne of CO₂ based on estimates of current carbon dioxide (CO₂) emissions from tropical deforestation¹⁰.

	Stopped deforestation	Deforestation reduced 50%
Pan-tropical		
billion tonnes CO ₂ emitted annually	3.6	1.9
US\$ value annually	\$53 - 106 billion	\$26 - 53 billion
Tropical Latin America		
billion tonnes CO ₂ emitted annually	1.7	0.9
US\$ value annually	\$25-50 billion	\$12-25 billion
Tropical Asia		
billion tonnes CO ₂ emitted annually	1.4	0.6
US\$ value annually	\$20 – 40 billion	\$10-20 billion
Tropical Africa		
billion tonnes CO ₂ emitted annually	0.5	0.3
US\$ value annually	\$8 – 16 billion	\$4-8 billion

¹⁰ Assumes all deforestation stopped and credited in carbon market. CO₂ emissions data from R. S. DeFries, R. A. Houghton, M.C. Hansen, C.B. Field, D. Skole, and J. Townshend. 2002. Carbon emissions from tropical deforestation and regrowth based on satellite observations for the 1980s and 1990s. PNAS 99 (22).

Table 2. Potential RED value as a proportion of GDP for selected countries

Given \$15-30/tonneCO₂, the annual value of stopping 50% of deforestation				
	(millions US\$)		(% of total GDP)	
	\$15	\$30	\$15	\$30
Democratic Republic of Congo	1,225	2,450	2.7%	5.5%
Indonesia	2,573	5,147	0.3%	0.6%
Brazil	6,861	13,723	0.4%	0.8%
Bolivia	495	991	1.8%	3.6%
Cameroon	381	761	0.9%	1.9%
Ghana	208	415	0.3%	0.7%
Malaysia	521	1,042	0.2%	0.3%

Forest and carbon data from FAO, FRA 2005 Annex 3: Table 4 and Table 14; GDP (PPP) from "World Development Indicators database" World Bank, 1 July 2007

http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP_PPP.pdf

[50% of 2000-2005 deforestation in hectares * above ground carbon per hectare *tC/tCO₂* \$15-30/tonne CO₂]

I. Distinguishing terms: avoided deforestation, reduced emissions, and other forest climate mitigation activities

Avoided Deforestation has been used as a general term for reducing deforestation and was the initial terminology used when inclusion of developing country deforestation in the UNFCCC agreement was first discussed in 2003. Avoided deforestation is seen as a reduction in forest loss, measured in number of hectares lost per year. While reducing the area deforested reduces greenhouse gas emissions (Figure 1), all forests do not release the same amount of CO₂ emissions per hectare when they are cut or burned. This leaves a disconnect between the land area metric typically used for measuring avoided deforestation and the GHG emission metric used for measuring climate mitigation effects.

Reduced Emissions from Deforestation (RED), was the terminology introduced with the 2004/2005 proposal by the CfRN, in part to distinguish itself from the failed inclusion of avoided deforestation in previous agreements, but also to focus on the climate objective. RED is directly linked to the climate outcome central to the UNFCCC agreements and to

the metric for the emissions market. Reduced *emissions* from deforestation are measured as a reduction in the tonnes of CO₂ released into the atmosphere. While this measurement is tied to the amount of forest loss (number of hectares per year), it also depends on the carbon density (tonnes of carbon per hectare) of each forest type (hectares times carbon density). As a result, reducing deforestation in carbon dense forests and soils like those found in the wet tropics would be more highly valued than a reduction of the same extent in lower density forests usually found in drier regions.

Reduced Emissions from Deforestation and Degradation (REDD) is an expanded RED policy with the inclusion of reduced emissions from forest degradation. While *deforestation* refers to a change in land use associated with the removal of essentially all forest cover, degraded forests remain forest, from a land use perspective, but lose substantial carbon density as they are altered by selective logging, lack of management, or natural factors causing a diminishment of the forest biomass. This loss in carbon density is often just as critical, if not more so, for some countries, as the loss of carbon through deforestation. Moreover, other important ecosystem services besides carbon storage may also be diminished via forest degradation. Therefore, there is some sentiment that the post-2012 international climate change should focus on REDD rather than just RED.

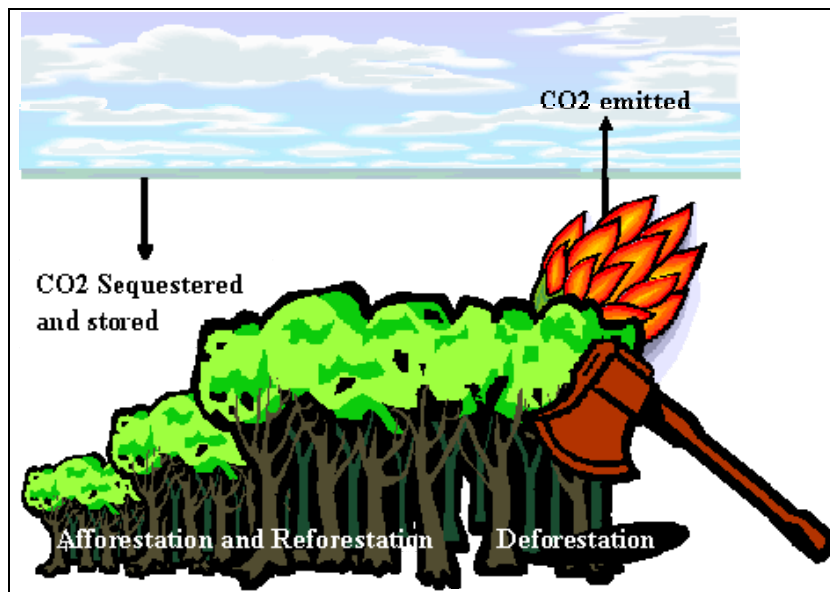


Figure 1. Forest activities as sinks or sources for the greenhouse gas carbon dioxide (CO₂)

Afforestation and Reforestation are the planting and growing of forests where none now stands¹¹. These activities remove CO₂ from the atmosphere, sequestering carbon, while they grow (Figure 1). Afforestation and reforestation are included in the Kyoto Protocol

¹¹ Reforestation generally refers to the re-establishment of forests on land that had been forested at some point in recent history (e.g., 50 years), where afforestation typically refers to the establishment of forests on land that have not held forest for a long time, if ever.

under the Clean Development Mechanism (CDM), which allows GHG offset projects in developing countries to be paid for by covered entities in developed countries committed to a GHG target. Forest management is not currently covered under CDM but it can also sequester carbon and could be included with CDM if parties were to agree to do so in the future.

II. Why RED presents an opportunity for climate protection, other forest ecosystem services and sustainable development

(1) Opportunities for Climate Protection

Reducing deforestation rates by 50% can avoid the release of up to 50 Gt of carbon (183 Gt CO₂ eq) this century, equivalent to the emissions produced globally over 6 years at current rates¹². In the near term, slowing deforestation can significantly reduce the accumulation of carbon dioxide in the atmosphere, slowing the rate of climate change while industrialized nations and emerging economies transition to new technologies and decarbonize their economies. Forests provide a low-cost option for industrialized nations to finance emissions reductions while also providing a new source of capital to help tropical nations finance forest conservation and the necessary alternatives for development. This has the mark of a potential win-win-win proposition – slowing climate change, saving tropical forests, and advancing development goals. Thus it is rapidly gaining momentum in the UNFCCC process and is also making its way into the multilateral G8+5 dialogues.

(2) Opportunities for protecting other forest ecosystem services

With human expansion over the last 3 centuries forest area has been reduced 40%. While Europe and North America have recently seen forest regrowth as they have transitioned from extractive to industrialized and service economies, deforestation in tropical countries continues at an annual rate of over 10 million hectares per year – an area larger than Greece- with even further damage from fragmentation and degradation of many remaining forests¹³.

If such rates continue unabated, the world risks losing a treasure trove of resources with extraordinary ecological, economic, and spiritual value. In addition to carbon storage and climate stabilization, forests have numerous other benefits. While some “products” are compensated in our market system; timber, fruits, non-timber forest products, and

¹² R.E. Gullison, P.C. Frumhoff, J. G. Canadell, et al. 2007. Tropical Forests and Climate Policy. *Science* 316:985-986.

¹³ Millennium Ecosystem Assessment. Chapter 21 <http://www.millenniumassessment.org/documents/document.290.aspx.pdf> And FAO, 2001c: Global Forest Resources Assessment 2000—Main Report. FAO Forestry Paper 140, Food and Agriculture Organization of the United Nations, Rome, 482 pp.

recreation and tourism, many other “services” are not; biodiversity, water quality, flood mitigation, and maintenance of microclimate, cultural and community health, and non-market livelihoods. While these latter ecosystem services have economic value, the failure of markets to reward landowners for providing these services causes forests to be undervalued and cleared for other uses with higher market returns. This underlies a combination of economic, political and institutional factors that have caused and continue to cause widespread deforestation in many parts of the world. Tying forest to a robust carbon market through political and institutional change provides the opportunity and economic driver for conserving forests and the rich array of ecosystem services they provide.

Economic models of the global forest sector, find that at carbon prices as low as US\$ 1.50 to 3.50 per tonne of CO₂ could result in reductions of global deforestation emissions by as much as 14 to 50%¹⁴. However, these models are based on a global forest carbon compensation policy and thus do not account for the possible emissions leakage to areas not covered by the policy.¹⁵ Other models show leakage can be as high as 70% or higher if complimentary policies are not included¹⁶. High leakage would raise the effective cost of such a compensation policy. Partial cooperation between countries is unlikely to be sufficient to address leakage; widespread pan-tropical cooperation and complementary policies at a national level will likely help. We address this issue further in the remaining challenges section at the end of this report.

(3) Other environmental and social effects

The environmental and social benefits of a RED program could differ substantially from those associated with afforestation and reforestation in the existing CDM projects. RED likely brings greater environmental co-benefits, particularly the maintenance of biodiversity. Maintenance of existing forests, especially those that are “old growth” and native to the area, tend to provide other ecosystem services society values, often in ways that a re-growing, or non-native forest cannot. Under CDM, afforestation and reforestation do not have to be native forest, which raises some concerns about the full ecological consequences of these projects, depending on the land use prior to planting.

¹⁴ B. Sohngen and R. Beach (2006) Avoided deforestation as a greenhouse gas mitigation tool: Economic issues for consideration. Working paper.

[Note: All forest carbon is accounted in other words all activities - deforestation and afforestation and all countries are included, not just those in the tropics.]

and

G. E. Kindermann, M. Obersteiner, E. Rametsteiner, and I. McCallum. (2007) Predicting the deforestation trend under different carbon prices. FEEM working paper no.29.

¹⁵ The RED payments could be available to a subset of countries on a voluntary basis, leaving countries not eligible for payments or those who opt not to participate in the system outside of the market.

¹⁶ Gan, J., and B.A. McCarl, "Measuring transnational leakage of forest conservation," Ecological Economics, forthcoming, 2007.

The forestry component of CDM has been very small and is likely to remain so without revision to the program (more in Section III. 1.5). It is uncertain how big a RED program might be, but the potential is substantial and thus the flow of capital that might feed into sustainable development projects and local community economies could have a big impact. RED policy can have positive or negative impacts depending on how it is implemented at the national and local level. An example of negative local impacts might come from a RED promoted program that blocks local forest use without providing alternative livelihoods. A program that negatively impacts the livelihood of local populations is simply less likely to succeed, regardless of its potential environmental benefits.

While protecting and promoting local communities and indigenous people are often noted in discussions as important aspects of a RED policy, some advocacy groups are concerned that these communities do not have a voice and that the top down policies now under discussion could harm those with little economic or political power¹⁷. They are concerned that national implementation of RED could lead to: greater state control over forests, more exclusionary models of forest conservation, military enforcement of forest protection, violations of indigenous land rights especially where tenure is unclear, corruption and hoarding of funding by officials, land speculation, and property rights conflicts. Experiences with past forestry programs and projects and with CDM have been mixed, but efforts are underway to better address local communities and sustainable development as the policy moves forward.¹⁸ These issues are discussed further in the remaining challenges section of the paper.

(4) Why avoided deforestation from developing countries was not included in the initial international climate agreements under CDM

Despite the tremendous benefits discussed above, agreement was not reached on inclusion of avoided deforestation from non-Annex 1 countries under CDM for the first phase of the Kyoto Protocol for a number of reasons outlined below.

1) Concerns about environmental integrity.

It was uncertain whether emissions reductions from avoided deforestation projects would be real. There were concerns about the quality of existing data on deforestation rates and carbon emissions from deforestation and whether these deficiencies could

¹⁷ T. Griffiths. 2007. Seeing 'RED'? Avoided deforestation and the rights of indigenous peoples and local communities. Forest Peoples Programme.

¹⁸ P.H. May, e. Boyd, F. Veiga, and M. Chang. 2004. Local sustainable development effects of forest carbon projects in Brazil and Bolivia: A view from the field. International Institute for Environment and Development, London.

and
R. Winterbottom. (1995) The Tropical Forestry Action Plan: Is It Working? National Association for the Practice of Anthropology Bulletin Vol. 15, No. 1, pp. 60-70.

be adequately resolved to verify performance¹⁹. In addition, leakage, the shifting of emissions from one location to another, could be substantial and was considered difficult or impossible to track. Together, these factors caused concern that avoided deforestation projects would be difficult to monitor and ultimately ineffective; therefore they should not be used as a means to offset emissions from other countries and sectors.

2) *Undercutting incentives for low-carbon technology transition.*

Storing carbon in forests provides only a temporary and partial solution. *Temporary* because forests reach a biophysical saturation point where they no longer accumulate carbon and they are subject to re-release through natural or human disturbance. *Partial* because there is not enough biophysical or economic capacity for forests to solve the climate problem alone. Forest carbon sinks are often considered an essential bridging strategy, providing some emissions reductions now while the necessary technologies to transition our fossil fuel-driven economies are developed, demonstrated and deployed. Where developed countries are allowed to pay developing countries to offset their fossil fuel emissions with forests, these offsets could be substantially cheaper than making the major transitions in energy and transportation needed at home. So, if large offsets are possible, it weakens the incentive for the technology transition and may impede progress toward low-carbon solutions, and perhaps weaken the political will for steep future cuts. We discuss this more in the remaining challenges section.

3) *Sovereignty over economic development in the developing countries.*

Developing countries were concerned that allowing avoided deforestation in the international agreements, even with a voluntary project-based system, could result in the “buying up” of their forests, thereby constraining their economic growth and development goals.

III. Toward implementation - What form might a RED policy take?

Today, rapid forest loss continues in many developing countries. With the continued need for emissions reductions from as many sources as possible and significant capital flowing through the European Union’s emissions trading market; it is not too surprising that a proposal to include deforestation in climate agreements is gaining momentum. The new RED proposal focuses on a national level system, rather than the project level system used in the CDM²⁰. As a result, the countries maintain control over how deforestation is addressed and the sovereignty concerns diminish. While some of the

¹⁹ E. Kintisch. 2007. Carbon emissions: Improved monitoring of rainforests helps pierce haze of deforestation. *Science* 316:536-37.

²⁰ http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php

stumbling blocks in the initial Kyoto debates on deforestation have been addressed, some of the challenges remain and will be discussed further below.

In the UNFCCC 26th Meeting of the Subsidiary Bodies, May 2007 in Bonn, Germany, the Parties drafted recommendations on “Reducing emissions from deforestation in developing countries” for continued discussion²¹. The recommendations suggest support for a RED program and recognize the co-benefits of non-carbon forest ecosystem services as an important goal, but have not yet proposed a policy design. Recommendations include support for capacity building, technical assistance (data, measuring, reporting) and national pilot projects to identify options under given national circumstances; and suggest continued work and discussion on methods and policy approaches in upcoming technical meetings of the UNFCCC.

A number of different approaches for a RED policy are under discussion. The main initiative comes from the Coalition for Rainforest Nations (CfRN) which now includes 33 tropical nations²². Some of those within the coalition are championing different aspects of a policy approach. Brazil, not in the CfRN, has remained an independent voice with some differences of opinion with the coalition on how best to accomplish their common goal of reducing deforestation emissions. Since Brazil has by far the largest deforestation rate and Indonesia (in the CfRN) is a significant second²³, the engagement and participation of these countries is crucial. Details on areas of agreement and disagreement among tropical forest nations involved in the debate can be found in the text below.

The following sections discuss the options for structuring (1) policy, (2) financing, and (3) measurement for a RED system. While countries are in agreement on many aspects of the policy structure, details on financing and measurement approaches are still in discussion. We present ideas that are in general circulation and show how a system of the proposed parts may provide a greater whole.

(1) Policy Structure

While there is general agreement on the overarching policy structure for RED at the international level, there are a number of issues that remain under discussion.

Areas where agreement has been reached:

- Participation is voluntary.
- If countries decide to participate, they must measure and report emissions from deforestation.

²¹ <http://www.rainforestcoalition.org/documents/UNFCCCSBSTA2007110.pdf>

²² As of June 2007 there are 33 nations in this coalition.
<http://www.rainforestcoalition.org/eng/about/index.php>

²³ FAO, Forest Resource Assessment 2005. Table 2-5.
<ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E03.pdf>

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- Emissions are measured and reductions are compensated at the national level.
- Reduced emissions in non-Annex 1 nations are compensated by Annex 1 nations.
- Reductions are compensated only after they have been demonstrated.

Areas still under discussion:

- Will RED compensation be tied to the emissions market?
- What legal structure is most likely to be successful in instituting a viable RED program?
- Transitional issues: early action, enabling fund and pilot projects
- What activities will be included - degradation, conservation where deforestation is not occurring?
- How RED will work with the existing CDM program for afforestation and deforestation?

1.1 – Tying RED to the emissions market

The CfRN nations and the World Bank are interested in linking avoided emissions to the carbon market so developing countries can harness the billions of (US) dollars that reduced deforestation can potentially provide (Table 1). They propose RED would provide an offset market for developed countries that are mandated to meet emission targets. In contrast, Brazil advocates a RED program completely separate from developed country emission obligations, where emissions reductions are compensated outside the market and are supplementary to the GHG reductions required by Annex 1 nations under the Kyoto Protocol. The money available for such an international trust fund would require extra capital voluntarily provided by developed countries above and beyond that spent achieving their own reductions, and it seems likely to be much smaller than what is possible through a market. Tying RED to a robust global carbon market seems the most viable option for a successful program and may be the only way to supply sufficient new resources for a widespread reduction in deforestation.

1.2 - Legal options for instituting RED

Four distinct legal options for instituting a RED policy to consider are²⁴:

- 1) *Developing countries join Annex B²⁵ of the Kyoto Protocol.* This route is legally complex because it requires fundamental amendments to the UNFCCC convention and the Protocol. It would also require any country joining Annex B to take on commitments for all of their emissions (fossil fuel and forest).

²⁴ A. Petsonk. 2005. Rewarding reductions, realizing results: legal options for making compensated reduction a reality. pp. 119-124. in *Tropical Deforestation and Climate Change*. Edited by P. Moutinho and S. Schwartzman. Amazon Institute for Environmental Research.

²⁵ Annex B countries are those that ratified the Kyoto Protocol with the presumption of being held to binding reduction commitments. Annex I countries are those that ratified the Protocol and formally accepted the commitments. All Annex B countries are Annex I, except the United States and Australia.

Although this could be beneficial for countries with deforestation rates significantly higher than other emissions, but it would require more extensive and costly emissions accounting. By and large, though, it seems quite unlikely that many developing countries would willingly agree to mandatory GHG targets at this point in their development path. It may also legally restrict non-ratifying countries (the US and Australia) from participating in emissions trading with these new entrants, limiting access to the full market.

- 2) *Expand the CDM to include RED.* While this is a relatively simple option, in that it does not require amending the treaty, it could upset the careful negotiations on the the role of carbon sinks from land use, land use change and forestry (LULUCF) in the Marrakesh Accords²⁶. The CDM also imposes an arbitrary limit for the extent to which its certified reductions can be used to offset capped emissions in Annex B countries, which is unlikely to be met by afforestation and reforestation projects, but likely to be surpassed if RED credits were allowed. Finally, such an approach uses expansion of a project-based institution (CDM) to implement what has been agreed should be a national-based system.
- 3) *Stand-alone agreement.* Implementation of a RED system could operate completely outside of existing structures under the Kyoto Protocol by introducing an entirely new protocol to the UNFCCC or going outside of the UNFCCC framework altogether. While starting from scratch offers a clean slate, it could be difficult to get broad agreement on the terms for linking RED credits to the broader emissions market.
- 4) *Get the UNFCCC Conference of the Parties to agree to “guaranteed carbon market access”.* For this agreement, if non-Annex I nations reduce emissions from deforestation before 2012, they could be compensated based on fair and equitable bases by tradable credits beginning in 2013 in accordance with rules to be determined. This supports early action and forces a decision, yet leaves room to develop a viable program and negotiate details. In case RED is accepted by the Kyoto Protocol parties rather than the full UNFCCC, a parallel agreement could be sought under the Protocol.

1.3 - Early Action, Pilot Projects, and an Enabling Fund

Without a significant change in policy, deforestation will likely continue to proceed at a steady pace. Once the forest is gone the opportunity to avoid its emissions and protect its other ecosystem value is lost. There is general agreement that reductions in deforestation need to start soon, before the next Kyoto commitment period in 2013, and with some certainty of financial compensation. This certainty that early reductions will be credited will help motivate private capital and accelerate action.

For early action to proceed, parties will need to know how to measure RED activities at a national level to qualify for compensation. This is being addressed through a number of

²⁶ The Marrakesh Accords is a set of agreements reached at the Conference of the Parties 7 meeting in 2001 on the rules of meeting the targets set out in the Kyoto Protocol. - http://unfccc.int/cop7/documents/accords_draft.pdf

initial pilot projects that are underway or will be in the next few years. These projects are and will be funded by NGOs, the World Bank, and private capital.

Building the capacity for forest measurement and monitoring and for the design and implementation of new national policies and institutions could be expensive and take time. Since RED will likely require proven reductions in deforestation before compensation will be provided, the significant up-front costs and the risks they entail need to be addressed soon. The CfRN, Brazil, and other nations agree on the need for what they are calling an “Enabling Fund” to support the needed capacity building. The World Bank’s new \$250 million Forest Carbon Partnership Facility is intended to do a number of things. Among them is to jump start capacity building in 20 developing countries.

1.4 - Forest Activities Included

Reduced deforestation can provide globally significant emission reductions and is relatively easy to measure and monitor. However, only a limited number of countries with relatively high current deforestation rates will likely benefit from a RED program. Around 40 (of ~150) tropical nations deforested 50,000 hectares per year or more between 2000 and 2005. Brazil and Indonesia have by far the highest rates (Table 3).

Table 3. Non-Annex 1 countries with the highest deforestation and reforestation rates between 2000 and 2005

Countries with largest Deforestation rates	Ha/yr	Countries with highest Reforestation Rate	Ha/yr
Brazil	-3,103,000	China*	4,058,000
Indonesia	-1,871,000	Viet Nam	241,000
Sudan	-589,000	Chile	57,000
Myanmar	-466,000	Cuba	56,000
Zambia	-445,000	India	29,000
United Republic of Tanzania	-412,000	Rwanda	27,000
Nigeria	-410,000	Algeria*	27,000
Democratic Republic of the Congo	-319,000	Côte d'Ivoire	15,000
Zimbabwe	-313,000	Costa Rica	3,000
Venezuela (Bolivarian Republic of)	-288,000	Egypt*	2,000

* Less than half of the country is considered tropical

Sources: Table 2.5 and 2.6 in FAO Forest Resource Assessment 2005²⁷; and Annex 3: Table 4 in the FAO report 147.

Countries with more forest degradation than deforestation, including many of those in the Congo Basin, would like the program to include reduced degradation (Reduced

²⁷ Source: FAO, Forest Resource Assessment 2005. Table 2-5.
<http://ftp.fao.org/docrep/fao/008/A0400E/A0400E03.pdf>

Emissions from Deforestation and Degradation – REDD). Countries with little or no deforestation, and very little net forest change, such as Belize, Costa Rica and Guyana (there are around 10 such tropical forest countries based on FAO data), would like the program to provide some compensation for maintaining existing forests, rather than avoided deforestation. These countries would not be covered by a RED proposal because their baseline emissions from deforestation are zero or close to it and they cannot do better than that. These countries are proposing a “stabilization fund” for maintaining their forests (described further below). All countries would like reforestation and afforestation activities that are now covered under CDM in the Kyoto Protocol to remain and complement the RED program. China, Viet Nam, Chile, and Cuba all reforest more than 50,000 hectares per year (Table 3). Table 4 provides an overview of what policy, RED or another complementary policy currently under discussion, a country might benefit from based on the characteristics of its dominant forest activities.

Table 4 Country characteristics and the forest activities they would like covered.

Country Characteristics	Example region	Policies that help (Activities Included)
High rates of deforestation	Brazil	RED Compensation for reduced emissions from deforestation
High rates of forest degradation that does not transition into deforestation	Congo Basin Countries	REDD Compensation also for reduced emissions from degradation
High forest cover with little or no deforestation.	Costa Rica	Stabilization Fund Compensation for conserving existing forest where deforestation is not occurring
High cover of managed forest with little or no deforestation or reforestation	India	FM in CDM Compensation for increased sequestration from improved forest management
High potential for afforestation and reforestation (AF/RF)	Brazil, China	CDM Clean Development Mechanism – compensation for sequestration in afforestation or reforestation

Including Degradation

In many countries forest degradation, not deforestation is the major problem. In general forest degradation reduces the productivity and health of forests and in doing so emits CO₂ to the atmosphere. Activities such as illegal logging and firewood collection can degrade a forest. Including emissions from degradation in a RED program, which would

make it REDD, is beneficial because it avoids making arbitrary distinctions about where to draw the line between deforestation and degradation and will help avoid internal leakage, where degradation increases as deforestation declines. Unfortunately it presents a new problem, distinguishing forest degradation from forest management activities like selective logging followed by stand regeneration (which does not necessarily degrade the forest). It is difficult to measure and monitor forest degradation, thus coming up with effective and acceptable methods will take more work, but the measurements should improve over time as new tools come online. If the parties decide to include reduced emissions from degradation, it will need to be tracked and monitored as accurately as possible and should only be credited in countries where/when it is clearly demonstrated.

Including a Forest Stabilization Fund

A number of countries have proposed expanding beyond RED and including what they are calling a stabilization fund to maintain forests in countries where deforestation is not occurring (countries that would not be included in RED). Providing incentive to maintain forests in countries with low or no deforestation can reduce between country leakages, reducing the likelihood that demand for forest products and clearing forest for agriculture will shift to countries outside the RED system. This fund could be designed so that countries that join receive compensation for maintaining their existing carbon stocks and in return agree to mandatory measuring and monitoring of their forests at a national level by the same system as those countries within the RED system.

Based on the existing system, to maintain environmental integrity of the emissions market, emissions must be avoided or sequestered. A stabilization fund would be designed to conserve forests where there are no clear emissions benefits and thus no clear tie to the emissions market. Given this disconnect from the market, how would it be funded? And how much compensation is sufficient to maintain carbon stocks in the face of increased pressure on the global timber and agricultural markets? One proposal is to incorporate a transaction fee in the RED program that would go toward this fund²⁸. However the fund is financed, the funding structure would have to address permanence of these forests just like those countries in the RED program. While specifics of how such a fund would work are still undecided, a fund for maintaining existing carbon stocks might have to be quite large to cover existing forests in all potential country participants.

1.5 - Interactions between CDM afforestation/reforestation and RED

As described above, the Kyoto Protocol's CDM provides a venue for Annex 1 countries to pay for mitigation projects in Non-Annex 1 countries and use the credits generated by these projects to meet their emission reduction commitments. Within forestry, the CDM only allows projects for afforestation and reforestation, not avoided deforestation or forest management, and it limits the total offsets allowed for an Annex 1 country to 1% of their certified emissions reductions. It is a project-based (subnational) system, it credits individual projects on specific plots of ground, ranging from small landholdings to

²⁸ UNFCCC Subsidiary Body for Scientific and Technological Advice submission by Congo Basin Countries Twenty-sixth session. Bonn, 7–18 May 2007.

those in the hundreds of thousands of acres or more. The projects must demonstrate that they sequester carbon or reduce emissions that are real, verifiable, and consistent with sustainable development goals. There is only one registered forest project to date under the CDM, and seven more are in the pipeline. This is a tiny proportion of the CDM program²⁹ and unless there are changes that increase the benefits of forest projects it is unlikely to be of major importance in global forests, climate, or development.

As noted above, the RED policy, as proposed and supported by many countries, cannot fit within the CDM framework due to fundamental differences in structure, thus RED is seen as a complementary but separate policy from CDM (Table 6).

Table 6. Comparison of CDM and RED(D) Features

CDM	RED(D)
Part of UNFCCC Kyoto Protocol	Hoped to be in post 2012 KP agreements. Separate from CDM.
Tied to carbon market	Tied to carbon market
Covers <ul style="list-style-type: none"> • some energy projects, industrial gases, methane reductions from waste, etc... • afforestation and reforestation 	Covers <ul style="list-style-type: none"> • deforestation • and maybe degradation
Sequestration in growing forests	Reduced emissions from deforestation of mature forests, primarily
Project-based accounting and compensation	National-based accounting and compensation
Transfer of funds for forests relatively small due to stringent rules and high transaction costs. Only one project registered in the system, but others in pipeline.	Transfer of funds for forests potentially very large (billions). Actual transfer will depend on measurement and financing structure.
Limits CDM offset credits that Annex 1 countries can use to 1% of total needed credits. A constraint unlikely to be met with reforestation and afforestation.	No limit to offset credits currently proposed. Reduced deforestation has the potential to provide substantially more than 1% of Annex 1 countries needed credits.

Countries that are engaged in afforestation and reforestation CDM projects or see significant potential in this program may be concerned about the addition of RED offsets into the market. Adding RED would greatly increase the supply of forest offsets, which

²⁹ CDM project overview – May 2007. <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1281.pdf>
Facilitating Reforestation for Guangxi Watershed Management in Pearl River Basin
<http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154534875.41/view.html>

may reduce the price of the CDM projects underway or hoped for³⁰. However, unless there are changes to CDM it seems unlikely to be an important program for forestry in most countries. Given the benefits to many countries in compensating reforestation and afforestation, there may be interest in expanding CDM or finding other ways to credit these activities if CDM is insufficient, but it will be important to maintain the requirement that projects meet sustainable development goals. Experience has shown that afforestation and reforestation can have undesirable side effects on the local environment and communities if they are not carefully planned³¹.

CDM has provided some experience for what does and does not work. In part because of this experience, but also due to the nature and scale of deforestation, the proposed RED policy avoids some of the constraints that have kept forests from being a significant part of CDM. A number of reasons are suggested for the small number of CDM forest projects. Proposed projects often fail due to incomplete methodologies, not following COP or IPCC rules, poor communication, inappropriate project scope, errors in data or equations, or aspects of the proposed project that can not be monitored. These all point to the need for greater in-country capacity building³², which is a priority for RED. Another problem has been the maximum size for “small projects”. Small projects, a size that may be appropriate for most afforestation and reforestation projects, can be overwhelmed by transaction costs³³. The project limits and requirements for CDM were set to ensure the environmental integrity of the projects, but perhaps there have been some lessons learned from this that can be applied to streamlining the process for RED. Since RED would use national-level accounting, aggregating all relevant in-country activity, rather than project-level accounting, the total changes in carbon emissions will be large and thus transaction costs will be much smaller on a relative basis (transaction cost/RED emissions credit).

³⁰ M. Jung. 2003. The role of forestry sinks in the CDM- Analyzing the effects of policy decisions on the carbon market. HWWA Discussion paper 241. (Assuming low cost to avoided deforestation with 1% cap on CERs, prices may be half as much as when only Af/Rf included; assuming high cost of AD, little difference in prices expected.)

³¹ L. Olander. 2006. Do recent scientific findings undermine the climate benefits of carbon sequestration in forests? An expert review of recent studies on methane emissions and water tradeoffs. Nicholas institute for Environmental Policy Solutions. Consensus Document. <http://www.env.duke.edu/institute/products.html#consensus> and T. Griffiths. 2007. Seeing ‘RED’? Avoided deforestation and the rights of indigenous peoples and local communities. Forest Peoples Programme.

³² http://ji.unfccc.int/Workshop/March_2006/Presentations.ppt/Pearson.ppt

³³ Carbon forestry: Who will benefit? Proceedings of a workshop on carbon sequestration and sustainable livelihoods. 2005 Eds. D. Murdlyarso and H. Herawati. Center for International Forestry Research. <http://www.rainforestcoalition.org/documents/CIFORCarbonForestry.pdf>

and Presentation by Benoît Bosquet, World Bank CoP12 Side Event, Nairobi November 14, 2006 [http://regserver.unfccc.int/seors/file_storage/sj857nysmj2lkom.ppt#544,1,Simple Proposals for a Future Regime on Forests and Agriculture](http://regserver.unfccc.int/seors/file_storage/sj857nysmj2lkom.ppt#544,1,Simple%20Proposals%20for%20a%20Future%20Regime%20on%20Forests%20and%20Agriculture)

(2) Financing Structure

Financing tied to the global emissions market appears to be the best option for bringing substantial new resources to reducing deforestation. Since there is still no political agreement on financing for RED, there has been little public discussion of how it will be structured. As discussed further below, it will be important to ensure sustainable development and environmental co-benefits are carefully considered and, if possible, incorporated directly into a system that will be paying for carbon emissions based on measurements of forests.

We provide a brief description of the basic components of a market-based financing structure and highlight some of the key issues to resolve.

2.1 Basic components of a market-based system:

- **Commodity definition:** To ensure fungibility with the broader carbon market, the traded commodity should be GHG emission reduction units, denominated in tonnes (megagrams) of CO₂ equivalent at a given point in time.
- **Buyers:** Buyers will be capped entities in countries with emission reduction commitments and perhaps entities not subject to a cap who decide to offset emissions voluntarily. The Kyoto Protocol provides the most extensive international driver of mandatory GHG reduction demands and allows international trading of emissions to meet commitments. The United States currently has a voluntary approach to GHG reductions, but seems more likely now to adopt a mandatory program, which would greatly expand the emissions market if it is based on a cap-and-trade system, as most of the current proposals are.
- **Sellers:** As discussed, RED compensation would be received at the national level. Countries must decide how to achieve national reductions using the mix of policies deemed most appropriate to national circumstances (internal compensation schemes, enforcement of laws, etc...). As intermediary, the national government could verify the reductions and provide performance guarantees to the international market.
- **Market-clearing platform:** Some means will be necessary to bring buyers and sellers together at an agreed upon price. Right now the European Union's Emissions Trading Scheme (EU ETS) performs this market-clearing function for mandatory UNFCCC commitments of the EU countries.³⁴ This type of platform can be broadened to link with other countries and other emission sources and offset institutions such as the Clean Development Mechanism. It could at least, in principle, be extended to markets for voluntary reductions from unregulated sources (e.g., the Chicago Climate Exchange in the U.S.). But whether or how these markets and others that develop will link together and whether the new

³⁴ Note that emission reductions through forest carbon sinks are not currently traded in the EU ETS

markets will also be buyers of UNFCCC generated RED offsets is uncertain at this time.

- Oversight: Some international body must be responsible for ensuring the integrity of the trades and enforce the legal framework that connects them to the regulatory or voluntary frameworks driving the market.

The emerging global carbon market has created the impetus for financial innovations to make these markets work more efficiently, such as electronic trading, brokering, derivatives and other financial instruments. As trading volumes increase, this can bring down transaction costs and ensure that more of the value goes to sellers and buyers.

2.2 Accounting for permanence

Since forest saved through national policies or local activities can later be logged or burn, the financing structure must insure that the reductions in emissions paid for are permanent. There are a number of viable alternatives to address permanence considered for carbon sinks in general, so it should not be a barrier to RED. For example, permanence-adjusted methods include³⁵:

- Comprehensive (Pay as you go): Balances carbon losses (debits) against carbon gains (credits) as they arise over time. If a carbon loss occurs, then the loss must be covered with a payback of credits to restore the balance.
- Temporary credits: Provisions could be put in place so that the credit must be redeemed at the end of a specified period (each credit has an “expiry” date). This imposes the discipline of balancing carbon debits and credits periodically. This idea was first advanced by the Colombia Ministry of the Environment in 2000 as part of the Kyoto Protocol negotiations on carbon sinks and is now the underlying principle for temporary Certified Emission Reductions (tCERs) for forestry projects under the CDM.
- Discounting credits: Account for the possibility of losses by reducing the amount of credit granted in the first place, based on assumed rate and timing of future loss. For example, a sequestered tonne might be assigned a half tonne worth of credits, reflecting a discount for planned impermanence. This is the type of approach used for sequestration projects on the Chicago Climate Exchange.

The bottom line is that some adjustment needs to be made to address the threat of impermanence of the avoided emissions from deforestation. It is important to recognize that temporary credits will generally be valued less than permanent credits in a carbon market. In the design of forest policies and projects all attempts should be made to enhance the permanence of the avoided emissions, thereby reducing the threat of loss, from both an environmental and economic standpoint.

2.3 – Financing the Enabling Fund

It is generally agreed that complementary financing for capacity building, pilot projects, and complementary programs will be needed for RED to succeed. This financing should

³⁵ Murray, B.C., B.L. Sohngen, and M.T. Ross. 2007. “Economic Consequences of Consideration of Permanence, Leakage and Additionality for Soil Carbon Sequestration Projects.” *Climatic Change* 80:127-143.

only be necessary to set up the system. Once countries are selling credits on the carbon market, ideally the system would be self-sufficient and sustaining. One question is where such funds will come from. Since the needs are preliminary to the establishment of a market, they are in essence seed money, rather than something that would be directly funded out of proceeds from the market to sustain activity. One important example of this type of endeavor is the \$250 million World Bank Forest Carbon Partnership Facility, recently announced as part of the G8 summit in Germany. This entity proposes to do many things including helping 20 countries measure their forest carbon and their reference emissions³⁶. Based on their accounting, perhaps a few times this amount, \$500 million to 1 billion might be sufficient to address most start up needs.

(3) Measurement Structure

For the RED policy as currently proposed, emissions from deforestation (and possibly degradation) will need to be measured at national level based on:

- 1) Area deforested (hectares)
- 2) Type of Forest (where deforestation or degradation occurred – in a palm forest, dense lowland forest or other)
- 3) Carbon content of that type of forest (tonnes of carbon per hectare)

From these data the carbon emissions can be determined.

The notion of *reduced* emissions from deforestation and degradation raises the question of what the reduction is compared to. The term “baseline” refers to a situation without a particular policy in place and is used as a reference scenario for quantifying performance. Any reduction of emissions to below the baseline or reference scenario might be considered additional and eligible for compensation. (For example: if the baseline emission from deforestation for country X is 20,000 tonnes of carbon per year and their emissions in their first year of accounting were 18,000 tonnes, they could receive compensation for 2,000 tonnes.) For the Kyoto Protocol a single reference year was selected for the baseline – 1990 emissions. For RED the baseline will likely be measured over multiple years to address year-to-year variability in deforestation. Because performance in the RED system would be matched by financial compensation, a rigorous and credible baseline is absolutely essential.

While there are still problems with the quality of data, most scientists agree that we have or can acquire sufficient data to get started with RED. The FAO forest inventory data provide a rough start on both forest and carbon data and will be greatly improved by remote sensing data and complimentary field measurements of forest carbon that already exist and even further by new measurements conducted in the initial years through capacity building efforts and pilot projects. The carefully crafted and negotiated methodologies now used for LULUCF under the UNFCCC - the Good Practices Guidance for Land Use, Land Use Change, and Forestry (GPG)³⁷ and the Revised 1996

³⁶ <http://carbonfinance.org/Router.cfm?Page=FCPF&FID=34267&ItemID=34267&ft>About>

³⁷ <http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.htm>

IPCC Guidelines for National Greenhouse Gas Inventories³⁸ - can be the basis for designing RED measurements and methodology. The tiered measurement system set up in the GPGs uses 3 tiers that range from coarse-resolution data using general equations to substantially refined local data used in sophisticated models. Such a system would provide flexibility for differences in technical capability among countries. Based on the precedents set by CDM and the voluntary carbon market, it seems plausible that the market could adjust to account for differences in measurement uncertainty. The price paid for reduced emissions from deforestation can reflect the uncertainty in the measurements. Those countries with better measurements might expect a better return for their reductions. More on measurement technology and financing will be discussed in the remaining challenges section.

Monitoring will be needed to assess whether reductions in deforestation are maintained over time, so any forest losses from natural or human activities can be accounted for. Permanence is accounted for in the financing structure as described in Section III (2). Existing remote sensing technologies make monitoring possible, if a bit rough, but new satellite sensors coming on line will greatly improve our monitoring capabilities.

Within-country leakage is addressed by national accounting, especially if degradation is included. However international leakage needs to be addressed at an international or pan-tropical level and the value of emission credits may need to be discounted (reduced) to address the increase in emissions elsewhere if they can be detected and attributed to the RED program in participating countries.

(4) Implementing RED(D) Policy at the National Level

Once a country voluntarily joins a RED(D) system, how can it reduce deforestation (and degradation), and how can it distribute the proceeds to benefit local communities and alleviate poverty? There are a number of different ideas for national programs to reduce forest loss and a few innovative national programs and pilot projects that are beginning to test some of these on the ground.

4.1 – Ideas for national programs

There are two types of programs to consider: (1) direct pass-through of national level compensation to individual stakeholders and (2) use of national RED compensation for a portfolio of policies and incentives.

Targeted intra-national incentive programs (e.g., Payment for Ecosystem Services or PES programs) pay landowners to maintain land in forest. Although PES compensates landowners for the ecosystem services their forests provide, it may have little effect on reducing deforestation emissions if the government ends up paying land owners for what they would have done anyway (i.e., limited additionality). Unless a more targeted approach can be designed to reach those landowners that would otherwise cut their forests, one might expect little change in the pre-policy trends in forest loss and emissions at a national level. Moreover, within-country leakage of deforestation

³⁸ <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>

emissions can still be a problem in this system because it creates incentives for those not in the PES program to deforest to substitute for the land being protected. If additionality and leakage are problematic with conventional PES programs, they could be a fairly inefficient means to achieve a given RED target within country.³⁹ However, they could be an effective way to handle forest stabilization as discussed above, in that landowners are compensated for maintaining the status quo which may be able to enhance local benefits by encouraging support of other ecosystem services⁴⁰.

An additional portfolio of policies that can help reduce deforestation might include:

- *National system of forest projects*, building on the example of CDM where individual forest projects are designed and monitored. As with a national incentive program, it is important to target areas at risk of forest loss and to address the potential for leakage of forest loss to other areas within the country. To increase the success of projects as part of a national policy, the government could help by providing services that are needed for forest projects – for example: measurement, accounting and monitoring assistance, project aggregation, and insurance to address permanence and complementary programs.
- *Increased protection and enforcement of public lands*. A number of countries have substantial land in protected areas, but have rarely had the resources to enforce the protection. National funding could go toward greater enforcement for protected areas. This is a primary objective for the government of Brazil.
- *Reducing accidental fires*. Fire that spread from managed lands into forest can be a major component of forest loss, especially in dry years.
- *Clarification of land ownership*. This can increase local community engagement and forest protection if there is economic benefit. Communities given rights to their lands and that benefit economically from the forest are more likely to maintain the forests and enforce its protection. Community forest management schemes where the governments are handing over forests to local communities are being used throughout the tropics – around 14% of all forest in developing countries. Case studies show gains of 1-5 tonnes of C per hectare per year⁴¹.
- *Fund complementary employment and revenue programs* – such as programs to help improve and intensify agricultural and forestry production⁴² and promote off-farm employment opportunities. It is important to support programs that help use local labor and other capital (i.e. saw mills) that could otherwise be economic losses in activities that reduce deforestation. Efficiency improvements in forestry and agriculture can also reduce the demand for land-clearing that drives deforestation in the first place.

³⁹ Standard PES programs are not necessarily designed to require additionality for payment, so this is not necessarily a failure of PES design, but it may limit their use for targeting RED activity.

⁴⁰ F. Alpizar, A. Blackman, A. Pfaff. 2002. Payment for Ecosystem Services. RFF Resources. pp 20-22.

⁴¹ M. Skutsh. 2006 (draft). Community forest management as a carbon mitigation option.

⁴² K. M. Chomitz. 2006. Policies for national-level avoided deforestation programs: a proposal for discussion. World Bank Background paper.

A new opportunity to help mitigate climate change, save our forests, and reach our development goals

- *Taxation of large scale land clearance.* A disincentive to deforest combined with the incentives to keep forest may be an effective combination⁴³.
- *Strategic planning of road improvements and other infrastructure.*

One option not widely discussed at this time is the application of a national cap-and-trade system, like that being designed and used for meeting mandated emission caps in developed countries, for use in meeting deforestation targets. A country could cap deforestation and trade deforestation credits internally. The administration and any complementary policies for the system could be supplied by RED compensation, but the system itself would be a market that would be self-sustaining. Those who desire to cut forests would have to pay someone else to maintain forest where they were likely to cut it or to grow forest where none currently stands. This would mix the voluntary - a country opting to participate in RED compensation - with the regulatory - meeting these national reductions using a cap within the country.

Countries are likely to use a mix of these different approaches. Linking these programs to national land planning might provide significant added benefit by designing national programs and incentives that protect forests in ways that also maximize benefits to biodiversity and other ecosystem services (i.e. water quality, non-timber forest products...etc). National planning might also help a country better manage its leakage through a coordinated system of targeted incentives.

An estimate of the administrative costs for national PES policies conducted by the International Institute for Environment and Development for the Stern Review, suggests annual administrative costs for a payments system ranging from around US\$4 to \$15 per hectare. If deforestation rates are cut by around 50% (6.2 million ha per year), that would mean administrative costs of between US\$25 and \$93 million in year one and if deforestation rates continue to be cut and the program continues to grow in size, administrative costs will also continue to grow⁴⁴.

4.2 - Examples of national programs and pilot projects

National level policies:

Costa Rica has the best known example of a national system of payments for ecosystem services. Costa Rica PES system provides a mechanism for passing through payments to land owners for a range of ecosystem services including carbon storage. To date, there have been a number of problems, including targeting the right land owners, rather than supporting those who are already taking the desired action for other reasons or those who

⁴³ G. E. Kindermann, M. Oberseiner, E. Rametsteiner, and I. McCallcum. DATE? Predicting the deforestation trend under different carbon prices. ??

⁴⁴ M. Grieg-Gran. 2006. The cost of avoiding deforestation. Report prepared for the Stern review of the economics of climate change. International Institute for Environmental Development. London.

have little to lose⁴⁵. Another challenge has been encouraging consideration of multiple ecosystem services together to target higher value projects⁴⁶. The system is evolving and working to address these issues.

Brazil has gone in a different direction, trying to beef up enforcement, stop illegal logging and support legal logging in its forests. They have developed remote sensing tools to track illegal logging and in May of this year the government passed an amendment that requires proof that wood used in public construction and infrastructure projects is legally harvested⁴⁷. They also have a national forest concession plan that coordinates forestry activities with some concession fees going to greater enforcement.

Earlier this year in Bali, Indonesia the governors of 3 provinces instituted a temporary logging moratorium contingent on carbon finance. Efforts are moving forward rapidly to develop necessary baseline measurements and design projects. They will likely include a combination of reducing legal logging; prevention of illegal logging through enhanced community participation, enforcement and community development, and reforestation with native timber species, fruit, coffee and agroforestry⁴⁸.

Pilot projects (subnational):

While there are numerous projects on the ground for afforestation and reforestation, there are few focused on avoiding deforestation. One of the best known is the Climate Action Project, Noel Kempff Mercado National Park, Bolivia, coordinated primarily by the Government of Bolivia and The Nature Conservancy⁴⁹. This is the largest pilot project underway. With an initial investment of \$9.6 million in 1997, project partners acquired logging rights on 2 million acres of forestland adjacent to a National Park⁵⁰. While the initial project design incorporated community development, these programs were not designed with sufficient local input and have evolved into more effective programs over

⁴⁵ Alpizar, A., A Blackman, and A. Pfaff. Payment for Ecosystem Services: Why Precision and Targeting Matter. *Resources*. RFF. Spring, 2007. http://www.rff.org/rff/Documents/RFF-Resources-165_PaymentsforEcosystemServices.pdf

⁴⁶ A. Pfaff, J.A. Robalino, and G. A. Sanchez-Axofeifa. Payments for Environmental Services: empirical analysis for Costa Rica. Draft.

⁴⁷ http://www.iucn.org/en/news/archive/2007/06/12_forest.htm

⁴⁸ John O. Niles. Personal Communications

⁴⁹ <http://www.nature.org/initiatives/climatechange/work/art4253.html>

⁵⁰ Noel Kempff expects to reduce emissions by up to 17.8 million tons of carbon dioxide in the atmosphere over 30 years by avoiding forest conversion.

time. Currently complementary activities include monitoring logging companies and enhancing local sustainable agriculture and forestry⁵¹.

A more experimental pilot project in Brazil, called the Bananal project, was designed, like Noel Kempff, with multiple objectives including forest protection and reforestation with a priority on social objectives. So far, work has focused on developing methodologies, local education, and trying to build local income generation activities, all activities that are hard to link directly to any reduced deforestation⁵².

Madagascar's Ministry of the Environment, in partnership with Conservation International and the Wildlife Conservation Society are developing carbon offset options to finance the Makira Forest Project; the protection of 350,000 hectares of forest. The project is expected to reduce carbon dioxide emissions by 9.5 million tonnes over the next 30 years. The project will work with local communities to improve farming practices so they can continue using the same land rather than clearing new land, increase employment with the project and for ecotourism, and clarify land tenure⁵³.

As discussed above, The World Bank recently announced \$250 million fund aimed at using carbon finance to reduce emissions from deforestation and degradation, the Forest Carbon Partnership Facility (FCPF). This partnership will pilot instruments for reducing emissions from deforestation and forest degradation in five tropical countries, to demonstrate and test mechanisms for creating tradable REDD carbon credits. It is financed by private investors and donors⁵⁴. This new partnership is part of the World Bank's Carbon Finance Unit, which includes the BioCarbon Fund and numerous other donor country specific funds, all of which are directed to develop carbon offset projects⁵⁵.

IV. Remaining challenges and how to overcome them

A number of challenges that were discussed in the 2003 debates on inclusion of avoided deforestation in the UNFCCC agreements remain and new ones are becoming apparent as we begin trying to flesh out how a RED policy would work on the ground.

1. Measurement

While there are still large uncertainties in the measurement of deforestation and the subsequent emissions, substantial work has been done to improve the methods. What is

⁵¹ P.H. May, E. Boyd, F. Veiga, and M. Chang. 2004. Local sustainable development effects of forest carbon projects in Brazil and Bolivia: A view from the field. Environmental Economics Programme, International Institute for Environment and Development.

⁵² same as 51

⁵³ http://www.celb.org/xp/CELB/programs/climate/conservation_carbon_makira.xml

⁵⁴ <http://www.un.org/News/Press/docs/2007/envdev922.doc.htm>

⁵⁵ <http://carbonfinance.org/Router.cfm?Page=Home&ItemID=24675>

different is that a national-level system forces aggregation of carbon accounting to a national scale, where the errors are smaller relative to the measurement. Second, there is promising new satellite technology coming on line that will substantially improve our ability to monitor deforestation and carbon. The general consensus in the scientific community is that we now have enough information to start a RED program, but continued improvement in measurements will be needed in many places. Many countries are now generating remote sensing data that can help to improve measurement of deforestation. It is crucial that they make this data more easily accessible and provide what is needed free or at little cost.

Another way to address uncertainty in the measurements may be in the valuation of RED credits. The market may account for measurement certainty in the value of credits whereby, a higher price would be paid for RED credits with more certainty (less error) in the measurements. This is already occurring informally in voluntary carbon markets. If a tiered measurement system, like that used in the Good Practices Guidance developed for land use and forestry in the UNFCCC, is used for RED measurement, the relative value of credits can reflect this.

2. Leakage

Intra and inter country leakage still need to be addressed, but there is promise that they can be reduced. Because RED is compensated at the national level, intra-country leakage is the responsibility of each nation that voluntarily participates. Pilot projects have shown that complimentary policies and programs can reduce local leakage and may help address intra-country leakage⁵⁶.

Inter-country leakage is not covered in the RED system, but will affect its environmental integrity. The best way to avoid leakage is to include everyone in the system (all forest activities and all regions), but this could be beyond the reach of the voluntary system that evolves. If comprehensive coverage is not possible, complementary policies and incentives that include as much as possible may be in order. The mixture of existing and proposed programs begins to create just such a framework where there is something for everyone (Figure 2).

⁵⁶ see 41 and 51

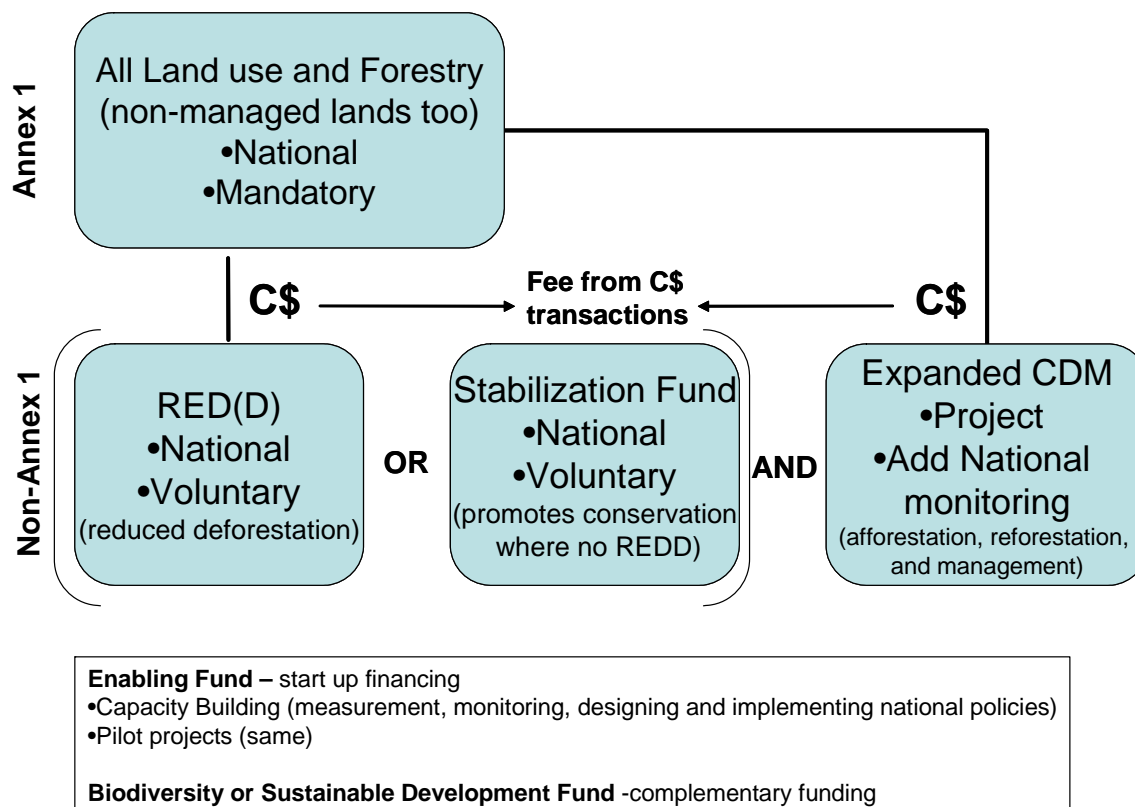


Figure 2. Framework for tying together existing and proposed forestry programs under the UNFCCC and linking them to a global emissions market.

3. Driver for needed technology transition

The availability of substantial low-cost offsets from RED could reduce the market incentive for technology development and deployment and slow abatement in the energy sector. The ‘bridge’ that the forests offer could be exploited but not used to ease the long-term transition with technology development and deployment. However, national climate policies that greatly increase reduction requirements beyond the short-term Kyoto commitments, include technology funding and limit offsets, may counter some of this delayed action effect. But there is debate among EU countries regarding how much of total allowed offsets can come from developing countries - some want to keep the offsets at home⁵⁷.

4. Promoting desired social and environmental co-benefits

As discussed above, conserving forests through national policies and an international emissions market can have both positive and negative impacts on local communities and

⁵⁷http://www.terraily.com/reports/Norway_Decries_EU_Protectionism_On_Carbon_Dioxide_Quotas_999.html

sustainable development. To address the reasonable sovereignty concerns of developing nations, the RED policy as proposed will compensate and be implemented by national governments. This is a top-down model. Whether additional social and environmental objectives can be imposed by an international policy focused on climate is uncertain and may be limited to suggesting general principles or goals to which national programs should aspire.

There are a number of countries currently testing Payment for Ecosystem Services policies which can help promote environmental co-benefits (other services such as water quality, flood mitigation, etc...) when designed well. If this is among the policies likely selected by countries, it may provide a framework for compensating other ecosystem services at a national level. Programs which help clarify land tenure and expand employment opportunities for agricultural and forest communities will likely provide hoped-for social co-benefits when they are used.

To address further social objectives or other avenues for environmental objectives at an international level, we provide a few ideas. These are taken from other examples or proposed as new ideas worth further exploration.

- *Require social and environmental benefits* in the international agreements by requiring that certain objectives are met by national programs based on set criteria, like the requirement for sustainability for CDM projects. (In the case of CDM sustainability is defined by the host nation for the project.)
- *Labeling or Certification* of a “socially and environmentally responsible RED credit” which would obtain a higher value on the open market. This program would be similar to dolphin-safe tuna, LEED standards for green buildings, or timber certified as sustainably harvested, which have had mixed results depending on the willingness of market participants to pay more for the desired attributes.
- *Complementary Social or Environmental Funds* could be developed to finance ecosystem services and social values outside the carbon market to ensure these values are incentivized in addition to carbon. It may be difficult to assign global market value for localized ecosystem services co-produced by forest projects, such as water quality, within an international market; however, services that have an international constituency such as biodiversity and poverty alleviation might be promoted through an international fund that provides additional payment for RED credits that enhance these desired services. The big questions for these funds will be: (1) how much value needs to be added to make the production of socially or environmentally responsible credits an achievable outcome? and (2) where would this money come from? They could be supported through private financing (e.g. donations from the NGO community or development agencies), or through some kind of transaction fee on all RED market transactions. And these co-benefits could be bundled, whereby biodiversity and social value are both added to the carbon value of a RED credit.
- *Bundling with Biodiversity Value* There is also an emerging market for biodiversity offsets that could be bundled with carbon offsets to enhance transactional value.

V. Recommendations

A RED policy has incredible promise for addressing threats from climate change, protecting forests, and enhancing economic and social welfare. But how the policy is structured and complemented by other programs and how it would be implemented at a national level can make or break it. To move a RED policy forward we recommend the following actions:

1. Support the continued development of a RED policy, whether through international negotiations or as a component of a domestic policy, that will be linked in some manner to the substantial capital that will be available through the global carbon market.
2. Push for more freely available remote-sensing data for monitoring and measurement of forests to allow countries to improve their forest measurement.
3. Promote funding and other assistance for: (a) building technical and institutional capacity, such as regionally coordinate centers for measurement and monitoring of land use change and emissions, data acquisition, technical training, and ideas and analysis for structuring national policies; and (b) Expansion of pilot projects.
4. Develop incentives to encourage early engagement of private capital.
5. Support coordinated conservation among countries that do not or cannot engage in RED. A forest stabilization fund may be necessary to combat international leakage - the shifting of emissions to countries that do not participate directly in the RED compensation policy. Cooperation among countries will be essential to reduce the transfer of logging and clearing for agriculture to other countries. Without more comprehensive forest coverage the RED program may have little overall benefit for forests or the climate.
6. Ensure that compensation for RED promotes the provision of other ecosystem services and local economic development, with standards that protect these other services and values and perhaps with private and public capital that can be used to incentivize these protective behaviors (i.e. biodiversity fund).