

Reducing Emissions from Deforestation in Developing Countries: Policy Approaches to Stimulate Action

Submission by Environmental Defense¹ and the Amazon Institute for Environmental Research² (IPAM) to the XXVI Session of the Subsidiary Body on Scientific and Technological Advice (SBSTA) of the UN Framework Convention on Climate Change (UNFCCC), 23 February 2007.

Summary. In 2005, a historic milestone was reached in Montreal when the UNFCCC Parties, at the initiative of Papua New Guinea and Costa Rica, launched a two-year process to decide how to address emissions from deforestation in developing nations. As a result of this process, in 2006 countries and observers had an opportunity to submit to the UNFCCC their views on the scientific and technical issues related to reducing emissions from deforestation in developing countries. In August 2006, a scientific workshop was held in Rome and there was a growing consensus that deforestation and degradation emissions can be *reliably measured at the national level by utilizing tools available today, including a combination of satellite-based imagery and on-the-ground sampling*. As a result of this growing consensus on the key scientific and technical issues, many countries favored using *market-mechanisms* as one of the primary policy approaches to create incentives for voluntary action.

Environmental Defense and the Amazon Institute for Environmental Research (IPAM) favor the use of market-based approaches to achieve the greatest and quickest amount of reduction in emissions from deforestation at the national level. Together with an international group of scientists, we have created and refined a policy approach called Compensated Reduction (CR). A country which uses a historical base period of emissions from deforestation as a reference would receive carbon credits for reductions below this reference period. Participation would be voluntary and carbon credits would

¹ Environmental Defense, formerly Environmental Defense Fund (EDF), is a non-profit, non-partisan non-governmental organization (NGO) specializing in the development of scientifically sound and economically sensible environmental policy. On behalf of our 400,000 members, we have participated in the UNFCCC as an accredited observer since its inception. Environmental Defense was instrumental in the design of the highly successful 1990 U.S. Acid Rain Trading Program to cut sulfur dioxide emissions, a program that served as a partial template for the 1997 Kyoto Protocol and the 2005 European Union Emissions Trading System (EU-ETS). Our work in 2006 resulted in emission caps in US states, including in California and the nine-state Regional Greenhouse Gas Initiative (RGGI). Our motto is "Finding the Ways that Work." For more information, see www.environmentaldefense.org/go/CR and www.fightglobalwarming.com, or contact Mr. Gustavo Silva-Chávez, gsilva-chavez@environmentaldefense.org.

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be awarded *post facto*. Developing countries would be able to access the capital flows in the emerging carbon market much more efficiently than thru current CDM, allowing them a chance to step forward and gain a financial benefit from doing their part to address the global warming problem.

Early analyses indicate that the available compensation would be much larger via the emerging carbon market than through existing methods such as foreign aid or even the CDM. For example, taking a weighted average of carbon market prices in 2004-2005 of \$5.63/t/CO₂, if Brazil reduced its deforestation by 10% against a baseline of average annual deforestation for the 1980s, over five years, these reductions could earn \$495 million per year, or \$2.47 billion over five years (Moutinho, Schwartzman, & Santilli, 2005).

- The potential revenue from the market is much larger than the funding that would be available through conventional bilateral and multilateral development assistance.
- Market approaches can create demand for positive environmental services (i.e.- permanence of carbon stock, forest preservation, biodiversity benefits, etc.)
- Dedicated funds can be important for building national capacity and infrastructure.
- A fund or a market can help pay for the remote sensing costs of creating a base period and monitoring reductions.
- Multi-lateral institutions have recently pledged to increase funding available to developing countries to help them reduce deforestation and receive carbon credits in return³.

Most of the 2006 submissions suggested that bilateral and multilateral ODA (overseas development assistance) be made available to help countries build technical capacity for addressing emissions from deforestation, and most favored some type of market mechanism as the means of providing compensation to countries that reduce deforestation. A fund with no access to the global carbon market, and with restrictions on fungibility, is unlikely to generate the financial resources needed to achieve large-scale reductions.

The scientific and technical issues are not barriers for using innovative policy approaches that provide incentives for voluntary action at the national level

In 2006, submissions from countries, observers and the scientific community, together with the Rome workshop, together all clearly led to significant conclusions on the current feasibility and future potential of using remote sensing techniques to detect land cover change at the national level. It is clear based on the opinions of some of the leading remote sensing scientists in the world that right now we have sufficient data and technical capacity to undertake a national-level inventory of land use change, including periodic

³ World Bank President Paul Wolfowitz Remarks at G8+5 Legislators Forum on Climate Change dinner Feb. 14, 2007

monitoring to detect annual variability⁴. Some additional key conclusions of the Rome workshop included:

Scientific, methodological and technical issues

- There was a growing consensus that deforestation and degradation emissions can be reliably measured at the national level by utilizing tools available today, including a combination of satellite-based imagery and on-the-ground sampling.
- For example, on January 2006, the Advanced Land Observing Satellite (ALOS) was launched by the Japan Aerospace Exploration Agency⁵. It is a new and powerful tool for detecting land changes and even works in areas with high cloud cover. Its three optical systems can obtain 3-d data on ground surface with a 2.5 meter resolution.
- It was acknowledged that scientifically robust tools, methods and data are available to monitor and estimate emissions from deforestation with an acceptable level of certainty.
- The possibilities for using these tools would depend on the availability of appropriate financial, technological and human resources, including capacity building.
- A combination of remote sensing, ground/field surveys and/or forest inventories, as well as the use of IPCC GHG inventory guidelines (Good Practice Guidance for LULUCF and 2006 Guidelines) can be used to estimate GHG emissions from deforestation.
- The process for estimating GHG emissions from deforestation will require financial and technical support as well as targeted capacity building. International collaboration could contribute to facilitating this support, including capacity building. The availability of positive incentives to address this issue could also contribute to facilitating this support.
- The IPCC is near completing a two-year process and report in which it has compiled methodologies on measuring emissions from deforestation and degradation.

The UNFCCC's ultimate objective, stabilizing GHG concentrations at a level that will avert dangerous climate change, can only be achieved by addressing *all* major sources of GHG. Absent “urgent and strenuous” emissions cuts in the next 20 years, the world will

⁴ The Workshop on Monitoring Tropical Deforestation for Compensated Reduction met in Jena, Germany on March 21-22, 2006 under the auspices of the Global Terrestrial Observing System’s Global Observations of Forest Land Cover Dynamics (GOFCC/GOLD). GOFCC/GOLD formed the ad hoc working group to provide technical guidance on remote sensing capabilities for monitoring tropical deforestation in the context of UNFCCC discussions on reducing emissions from deforestation in developing countries. The workshop considered current capabilities for monitoring deforestation and forest degradation at global and national levels. **The major conclusion was that changes in forest area can be monitored from space with confidence. The remote sensing and forestry communities represented at the workshop are ready to provide guidelines and protocols for monitoring emissions from deforestation in developing countries.** The working group is preparing a report to assess technical capabilities for estimating emissions as input to the upcoming SBSTA meeting.

⁵ Japan Aerospace Exploration Agency. http://www.jaxa.jp/projects/sat/alos/index_e.html

almost certainly be committed to a temperature rise, by 2050, of between about 0.5° C and 2° C relative to today, with possible breakup of the Greenland ice sheet and sea level rise that could render many cities uninhabitable.⁶

Action is needed today – time is running out

- The world's forests are disappearing. Large-scale incentives are needed immediately to protect the last remaining forests.
- Compensated Reduction can make a significant difference in meeting Article 2 of the Convention by reducing the largest source of emissions from developing countries.
- If nations wish to limit warming to not more than 2.0-2.5 degrees above pre-industrial levels, it is vital to include emissions from deforestation.

The release in February 2007 of the Summary for Policy for Policymakers of the Working Group I conclusions by the Intergovernmental Panel on Climate Change (IPCC) strengthens the case for significant reductions as soon as possible of *all* sources, including deforestation. The Summary was clear that ‘global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values...and increases in carbon dioxide concentrations are due primarily to fossil fuel use and land-use change [i.e.-primarily deforestation in developing countries]’. Environmental Defense believes that we know with sufficient certainty the causes of global warming. It is now time for countries to start exploring policy approaches that can lead to significant emission reductions by developed and developing countries.

Market and non-market policy approaches

As part of the UNFCCC two-year process, a number of countries and NGOs have proposed a variety of policy approaches to reduce emissions from deforestation. The approaches that have been proposed up until now can be put into two broad categories, market and non-market approaches as defined below.

Fund approach

Most of the 2006 submissions suggested that bilateral and multilateral ODA be made available to help countries build technical capacity for addressing emissions from deforestation, and most favored some type of market mechanism as the means of providing compensation to countries that reduce deforestation. A few suggested providing compensation via ODA, bilateral and multilateral agreements, public-private partnerships or other mechanisms. Under UNFCCC Articles 3.3, 3.4 and 4.7, the Parties could coordinate the assistance, and supplement it with debt-for-nature swaps, revolving funds, advanced payments, and new donor programs, among others. Moreover, some donors and some recipient countries might agree that, if reductions in deforestation were to become tradable in the future, and if the development assistance enabled

⁶ HJ Schnellhuber *et al.* (eds.), *Avoiding Dangerous Climate Change*. Cambridge University Press 2006; V. Bellassen & B. Chameides, “High Water Blues: The Climate Science Behind Sea Level Rise and Its Policy Implications—2005 Update” (Environmental Defense 2005), online: www.environmentaldefense.org.

the recipients to earn tradable units, then the recipients would transfer their tradable units to the donors at an agreed price.

Under this approach, financial resources would be put in a ‘tropical deforestation fund’ that developing countries would be able to access for a variety of uses, including an initial carbon inventory, monitoring and enforcement needs, as well as compensation for foregone revenue from deforestation. The source of the funding would be developed countries. In many ways, this is a continuation of ODA funds that would be specifically targeted for deforestation. Any reductions in deforestation would benefit the atmosphere but those reductions would not be allowed to be used by developed countries to meet their current and future Kyoto commitments. It is hard to envision that ODA funds could increase to the hundreds of millions or even billions of dollars necessary to achieve large-scale reductions in emissions. It is even harder to envision why developed countries would invest in reducing deforestation emissions when those reductions would not be creditable and freely tradable in a global carbon market.

- Dedicated funds can be important for building national capacity and infrastructure.
- A fund or a market can help pay for the remote sensing costs of creating a base period and monitoring reductions.
- A fund with no access to the global carbon market, and with restrictions on fungibility, is unlikely to generate the financial resources needed to achieve large-scale reductions.

Market approach

Under this approach, any emissions reductions that are real, verifiable and quantifiable would be freely tradable in a global carbon market. Market approaches do not exclude using a fund for capacity building purposes and in many cases a fund may be used to generate reductions that will then be paid using financial resources from the carbon market. The market creates the necessary incentive for developing countries to reduce their deforestation emissions and create supply, and for developed countries to buy these credits, create demand, and transfer resources to developing countries. Deeper Annex I commitments after 2013 than would be possible considering only Annex 1 fossil fuel emissions are *essential* to create this demand.

- The potential revenue from the market is much larger than the funding that would be available through conventional bilateral and multilateral development assistance.
- A market has built-in incentives for short and long-term emission reductions.
- Markets have the potential to engage orders of magnitude more financial support than even the most optimistic estimates of official development assistance (ODA) that could reasonably be expected from foreign aid. For example, in 2005 US foreign aid to Colombia was \$570 million, to Peru \$190 million, and to Bolivia \$180 million, almost all of it for drug eradication purposes.⁷

Environmental Defense supports using Compensated Reduction as the preferred policy approach

⁷ CRS Report to Congress. Foreign Aid: An Introductory Overview of US programs and policy. Updated January 19, 2005. <http://shelby.senate.gov/legislation/ForeignAid.pdf>

Compensated Reduction would reward countries that demonstrate a real decrease in deforestation. The [concept](#) is simple: Any nation that reduces national deforestation below a baseline (based on average historical deforestation rates) would be eligible for compensation, receiving emissions allowances tradable in the global carbon market. Economic analyses indicate that if CR were adopted and reductions in deforestation were eligible for compensation via the carbon market, then in a number of countries with high deforestation rates, market prices for carbon could make forest protection economically competitive with various alternative land uses – i.e., many people who live in forests would be able to earn more money by protecting the forest than they could by chopping it down. (Silva-Chávez 2005; Osafo 2005; Del Carmen Diaz & Schwartzman 2005).

- The compensation would be post facto. Successful countries would receive compensation after 2012 after real reductions were concretely measured; a portion of the tradable allowances would be held in an insurance reserve.
- Compensation for forest protection could be significant for many developing countries. For example, taking a weighted average of carbon market prices in 2004-2005 of \$5.63/t/CO₂⁸: if Brazil reduced its deforestation by 10% over five years, these reductions could earn \$495 million per year, or \$2.47 billion over five years.⁹
- To determine if real reductions occurred, a country's forests would be monitored by robust, reliable satellite imagery, supplemented by ground-truthing.
- At least one nation, Brazil, has already begun to demonstrate that it is possible, with serious and committed effort, to reduce deforestation.

Compensated Reduction involves a nation's entire forest system, not just individual projects, thereby avoiding problems that have hindered consensus on forest issues.

Applying Compensated Reduction at national levels overcomes or addresses the primary barriers to crediting – leakage¹⁰, additionality¹¹, and permanence.¹² By addressing deforestation at national levels, Compensated Reduction reduces "leakage"

- Compensated Reduction deals with intra-country leakage by moving away from the project-based approach, which is prone to high leakage.
- Under Compensated Reduction, inter-country leakage may still occur, but:
 - The more countries that adopt Compensated Reduction, the less the leakage.
 - Residual leakage can be addressed via market modeling and a discount rate.

⁸ Weighted average for the period January 2004-April 2005 derived from International Emissions Trading Association, "State and Trends of the Carbon Market, 2005", Washington, DC, May 2005.

⁹ Brazil's deforestation rate is 20,000 km² and a 10% reduction is equivalent to 2,000 km² annually. Carbon content is estimated to be 120tC/ha.

¹⁰ In this context, "leakage" refers to the possibility that protecting forests in one place will simply shift deforestation to another place.

¹¹ In this context, "additionality" refers to the deforestation that likely would otherwise have occurred in the absence of a global program for addressing deforestation.

¹² In this context, "permanence" refers to the possibility that forest protection might not be permanent, i.e., that forests once protected could later be destroyed, resulting in carbon emissions.

Using Historical Base Periods addresses "additionality"

- Measuring reductions from a historical base period of deforestation avoids the need to calculate project-by-project "additionality."
- Deforestation in large remaining forests will continue at current rates or increase over the next century, until forests are exhausted, and could release as much as 87 - 130 Pg C¹³. Consequently, *any* reduction below recent rates will help reduce global emissions. Base periods will have to be negotiated, but need not be a technically complex process.
- Ideally, using a base period that is a 5-10 year average will account for annual variations.
- At a minimum, two historical data points can be sufficient to establish a base period.

How Compensated Reduction addresses Permanence

- Reductions in deforestation need to be proved over a period of years (e.g. 5 years) before allowances will be awarded.
- "Banking", i.e., holding a portion of earned emission allowances in reserve, can address permanence by acting as an insurance against carbon losses.

Compensated Reduction allows flexibility for different deforestation rates in countries

- Compensated Reduction can be applied to countries with current deforestation and a majority of forests still remaining.
- CR addresses the U.S. Senate's 2005 Resolution stating that it is time for Congress to enact mandatory, market-based limits and incentives to slow, stop, and reverse greenhouse gas emissions growth in a manner that will not significantly harm the U.S. economy; and will encourage comparable action by other nations that are major trading partners and key contributors to global emissions.
- A [coalition of developing nations](#) has formally asked to have the issue of reducing emissions from deforestation placed on the agenda for the [Twelfth Conference of the Parties the UN Framework Convention on Climate Change](#).

Time is of the essence

- If Parties can reduce deforestation starting today, the COP can make any reductions earned between now and 2012 eligible for compensation post-2012.
- Awarding allowances for early action can promote immediate voluntary participation.
- By moving to a national-level approach, Compensated Reduction avoids project-by-project transaction costs, and can achieve reductions on a much larger scale.

Where should Compensated Reduction be negotiated-the Kyoto Protocol or the Convention?

- Although this issue does need not be decided right now, discussions regarding GHG emissions from deforestation should continue under the UNFCCC. However, the option

¹³ Houghton, RA. 2005. Tropical deforestation as a source of greenhouse gas emissions. In: [Tropical Deforestation and Climate Change](#), supra.

- of eventually addressing GHG emissions from deforestation in a second commitment period of the Kyoto Protocol should not be excluded.
- Parties should focus on the issues that need to be resolved to create the mechanism, and establishing absolute mandatory caps post-2012, with a trading system that recognizes Compensated Reduction.
 - Any post-2012 emissions control regime that seeks to avoid dangerous interference in the climate system must begin with a rigorous, science-based inventory of all emissions sources and possible reductions *before* Annex 1 targets are negotiated, and Annex 1 targets must take other reductions options (e.g., reduced deforestation) into consideration. Compensated Reductions should leverage deeper Annex 1 reductions than would be possible only considering Annex 1 fossil fuel sources. Consider a hypothetical negotiation between a tropical forest cartel and Annex 1 nations, posing two scenarios: in the first scenario, Annex 1 proposes to simply stabilize emissions at 5% below 1990 levels. The tropical cartel could then refuse to offer any deforestation offsets to Annex 1, but propose that if Annex 1 commits to tripling first commitment period targets, some proportion of these reductions could be met through purchase of deforestation offsets. Compensated Reductions seeks a system of leveraged offsets to increase the aggregate reductions possible, rather than a CDM-style flexibility mechanism that aims only to reduce abatement costs for Annex 1. International negotiations already trend in this direction: the EU has affirmed its willingness to reduce emissions a further 20% in a second Kyoto commitment period, or to increase the target to 30% if others are willing to take deeper cuts. Compensated reductions of deforestation might reasonably offer the leverage to justify the additional 10%.

Co-benefits

- Reducing deforestation emissions can help preserve biodiversity, conserve land areas for indigenous people, and provide ecosystem benefits to local communities and the planet.

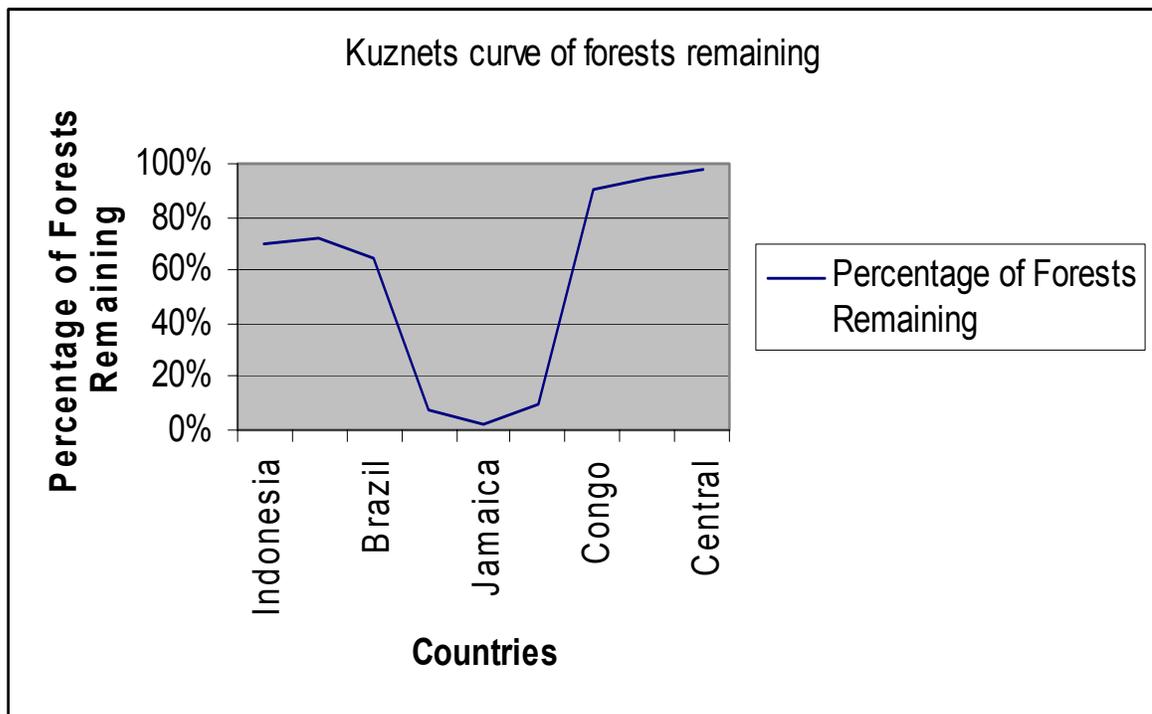
Effect of Compensated Reduction tons on the carbon market

- Compensated Reduction tons will not enter the market until 2013.
- Given the need for capacity-building, the reductions will likely be small at first and gradually increase over time.
- The scale of reductions needed to avert dangerous climate change means that incentives to encourage the maximum possible reductions should be offered.
- At the same time, experience indicates that reductions achieved will not necessarily be placed on the carbon market immediately. Sellers of reductions understand that it is in their best interest to maintain a supply and demand balance.
- Creating a pathway for bringing Compensated Reduction tons to the market provides leverage to seek steeper reductions from Annex I nations in the future.

CR for countries with low rates of deforestation and large remaining intact forests

The Compensated Reduction policy approach works very well for countries that have high historical rates of deforestation. However, there are a few countries with large intact forests that are *currently* not deforesting and hence not emitting carbon, but have the *potential* for doing so in the near future. For these countries, including Congo and Colombia, compensation for a reduction in historical emissions cannot be generated. Given this reality, any policy approach must provide incentives for *both* types of countries: those with past deforestation emissions and those with low current levels of deforestation but with large amounts of forests that barring any alternatives, will likely be deforested.

Graph- Kuznets curve-Three types of emission/forest cover countries



- The countries on the left hand side of the curve, in the 60-80% range of forests remaining are those with high rates of deforestation emissions. These countries clearly would benefit from CR.
- The countries at the bottom of the curve are those countries that have already deforested all or nearly all of their forests. For these countries, CR would not work well and reforestation activities, perhaps via CDM afforestation and reforestation projects at the project or national level, would help them restore their forests.
- The countries on the far right, with large intact forests and low rates of deforestation, would also not benefit from the conventional CR approach. However, due to the vast potential amount of carbon that could be released into the atmosphere if these countries have no options except to deforest, CR can be refined in a variety of ways in order to provide incentives for the high and low emitting countries.

Some possible refinements to the CR approach that would help countries in this situation include:

1- Growth budget option. Countries could be given "premiums", additional increments of tradable allowances which could help finance development that protects forests while promoting economic growth (Environmental Defense, 1997; Dudek & Goffman, 1997; Dudek & Goffman, 1998; Oppenheimer & Peterson, 2004). Countries could be given a multi-year premium, either at the Business-as-Usual (BAU) level or slightly higher (5% above BAU), that could be sold immediately in the carbon market.

2-An International Deforestation Fund. In addition to providing financial resources for capacity building in countries, a fund can also be used to compensate countries that would like to continue protecting their standing forests. A variety of funding sources are available, including the private sector, multi-lateral institutions, countries, philanthropic organizations and even individuals. Auctioning of allowances could also be a source of funding. The United States acid rain programme annually auctions a certain amount of allowances to the highest bidder.¹⁴

¹⁴ <http://www.epa.gov/airmarkt/trading/auction.html>

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