

Avoided Deforestation with Sustainable Benefits

A Simple Way to Reduce Carbon Emissions from Deforestation and Degradation



World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES



Climate Change and its global impacts can no longer be ignored. While cutting emissions from fossil fuel consumption obviously deserves continued attention by all levels of the global society, the approximately 20% of emissions that are due to loss of forests and peatlands cannot remain outside the purview of climate change mechanisms.

Recognizing this, the Conference of the Parties to the UN Framework Convention on Climate Change invited a discussion “on issues relating to reducing emissions from deforestation in developing countries, focusing on relevant scientific, technical and methodological issues, and the exchange of relevant information and experiences, including policy approaches and positive incentives” in its eleventh session on agenda item 6 (FCCC/CP/2005/L.2).

The World Agroforestry Centre (also known as the International Centre for Research in Agroforestry – ICRAF) prepared a submission for consideration in the discussion. The submission is based on extensive research across the humid tropics by a consortium of international and national organizations operating within the ASB Partnership for the Tropical Forest Margins (ASB), with key research results generated by Brazil, Peru, Cameroon, Thailand, Indonesia and the Philippines.

This brochure summarizes the case for avoided deforestation with sustainable benefits as a simple way to reduce carbon



Stable transition zones between agriculture and natural forests, often via a zone of ‘agroforest’, provide opportunities for ‘reduced emissions from deforestation’, as in this example from Jambi (Sumatra); Photo - Meine van Noordwijk

Why has 20% of the global CO₂ emissions been left out of global mechanisms?



What are the risks of not addressing the REDD challenge?



Full - system carbon accounting



National sovereignty on mechanisms



Why has 20% of the global CO₂ emissions been left out of global mechanisms?

Several years ago the international science community established that about 20% of global CO₂ emissions are generated through land use change and the conversion and degradation of forests. While the Clean Development Mechanism (CDM) of the Kyoto Protocol makes some allowance for afforestation and reforestation, it has so far excluded avoided deforestation. There are good reasons for this:

- The definition of what is and is not a ‘forest’ is ambiguous.
- The CDM has taken a project approach. Re-forestation deals with enhancing tree cover on degraded lands, where it is easier to monitor carbon stocks and attribute changes to project activities.
- The CDM mechanism pays great attention to ‘leakage’ (making sure that gains in one place don’t cause losses in another place) and ‘additionality’ (ensuring that carbon gained and/or conserved, relative to baselines, would not have occurred without the project) - issues that cannot be reasonably addressed in avoided deforestation projects with limited geographical scope.
- The complexity of rules for applying the Clean Development Mechanism to afforestation and reforestation has meant that many of the potential benefits have been offset by the costs of consultants, research organizations, and government agencies. Little carbon value has reached local beneficiaries.
- The National Guidelines for Greenhouse Gas inventories (IPCC) (modified 1996 and 2006) indicate 60% uncertainty on changes in country-wide carbon stocks, the largest uncertainty in quantification of GHG inventories.
- Much deforestation is actually planned by land managers and governments because it leads to land uses with higher economic returns. Completely avoiding deforestation would require offset payments that are not feasible under present circumstances. Negotiating intermediate targets for “partial deforestation” of a particular landscape would be very complex.



Large areas of forest in tropical countries have been converted to land use practices with low economic benefits, simply because the value of timber made it attractive for outsiders to log and nobody had effective control; Photo - Meine van Noordwijk

What are the risks of not addressing the challenge of Reducing Emissions from Deforestation and Degradation (REDD)?

Despite the difficulties, however, the global climate change community is increasingly recognizing that it must address the challenge of reducing emissions from deforestation and degradation (REDD). Besides the obvious magnitude of the potential for REDD to reduce climate change, the current situation is creating perverse incentives and disincentives affecting other dimensions of climate change mitigation. For example, an Annex-I country that imports biofuels from non-Annex I countries to meet its Kyoto targets is not accountable for forest conversion that biofuel production might cause. Further, public and political willingness to contribute to the control of GHGs through relatively small reductions elsewhere will erode if large and avoidable emissions are left out of scrutiny. Non-participation by the United States and Australia create similar problems for the Kyoto protocol.

The current 'avoided deforestation' debate offers a chance to correct some of the major inconsistencies. Some of the key constraints that need to be overcome relate to scale, scope, political commitment, technical procedures and data quality. Best practice is emerging on the types of national and local mechanisms that countries can apply with much lower transaction costs than current CDM projects. Avoided deforestation with sustainable benefits can generate both local and global benefits. Research by the ASB partnership and others shows that intermediate land uses can store significant quantities of carbon, maintain flows of ecosystem services, generate good economic returns and reduce pressure on remaining forest resources.

How simple can it be?

We can learn from the rules of the Kyoto Protocol that already apply between Annex-I countries, where all land use and land cover changes is accounted for, without restriction to any specific concept of 'forest', and without loss of national sovereignty over mechanisms. That accounting framework includes all changes in carbon stock (including peat lands, trees outside forests, agroforestry lands) plus flows of other greenhouse gasses.

A simple solution to the issue of 'avoided deforestation' at the international level would be to allow developing countries to be voluntarily listed in a new Annex X. These countries would follow current rules for land use and land cover related emissions that exist between Annex-I countries, while leaving the energy related emissions for future consideration. The Clean Development Mechanism would still apply in the energy sector, but the issuance of 'carbon credits' and associated markets would follow established procedures for Annex-I countries. No new procedures will be needed, transaction costs can be much reduced.

Full - system carbon accounting

The current IPCC Good Practice Guidelines for National Greenhouse Gas Inventory provide a coherent framework for dealing with aboveground as well as belowground carbon impacts of Agriculture, Forestry and Other Land Use (AFOLU). The IPCC framework could become the primary framework for reporting and accountability in non-Annex I countries, aligned with the rules that currently apply to Annex-I countries.

According to expert opinion in the IPCC community that is responsible for the guidelines, however, the net emission estimates from land use and land cover change may carry an uncertainty margin of as much as 60%. On the positive side, the use of the IPCC guidelines over multiple measurement periods will lead to a reduction of the overall error, as annual updates correct for previous errors and address the permanence issue. On the negative side, the current uncertainty margin of 60% is unacceptably high. The opportunity to participate in a market for reduced AFOLU carbon emissions would generate clear incentives to improve the accuracy of the accounts.

Data and methods available in national and international research networks can be analyzed to improve the accuracy of estimates, derive better estimates of the uncertainty, and identify ways to reduce it. The two components of uncertainty are interlinked: error in classification of land cover and land cover change, and uncertainty in the mean carbon stocks per unit area in each land cover class. A binary classification (e.g. with forest and non-forest as classes) is insufficient. Analysis so far suggests that a classification that results in 5–10 land cover classes may lead to the lowest overall uncertainty. Further data compilation and analysis is needed and possible. This has already started. The IPCC support office (<http://www.ipcc-nggip.iges.or.jp/tsu/tsustaff.htm>) is providing support to full system carbon accounting.



Fire is still the cheapest way to clear carbon rich landscapes. The economic value of the subsequent land uses may be less than the global costs of conversion; Photo: CIFOR/ICRAF Project on underlying causes of forest fires in Indonesia

ASB Summary Matrix: Forest Margins of Sumatra						
Land use	Global environment		Agronomic sustainability	National policymakers' concerns		Adoptability by smallholders
	Carbon sequestration	Biodiversity	Plot-level production sustainability	Potential profitability (at social prices)	Employment	Production incentives (at private prices)
	Aboveground, Time-averaged (tonnes/ha)	Aboveground, Plant species/standard plot		Returns to Land (US\$/ha)		
Description			Overall rating			
Natural forest	306	120	1	0	0	0
Community-based forest management	136	100	1	11	0.2	4.77
Commercial logging	93	90	0.5	1080	31	0.78
Rubber agroforestry	89	90	0.5	506	111	2.86
Oil palm monoculture	54	25	0.5	1653	108	4.74
Upland rice/bush fallow rotation	7	45	0.5	(117)	25	1.23
Continuous cassava degrading temperata	2	15	0	28	98	1.78

TP Tomich



Many managed landscapes with trees, such as this rubber agroforestry in North Sumatra, blend forest and agriculture, but may not fit existing forest definitions; Photo: Meine van Noordwijk

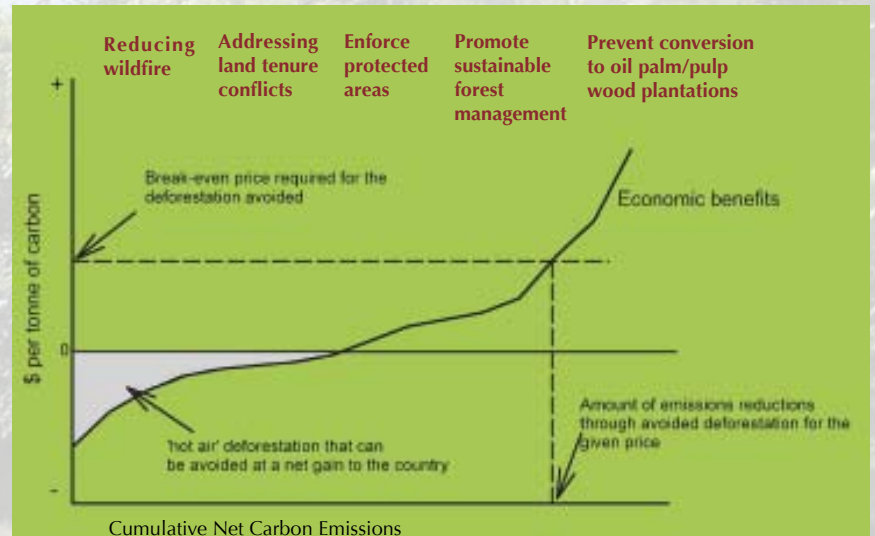
Negotiated baselines and carbon credits for actually reducing emissions

Once the playing field is selected and the rules of the game are set (e.g. AFOLU accounting at the national level), the real 'game' can begin: determining the baseline of expected emissions that will be the basis for deciding what would constitute 'reduction'. In some ways this is akin to a market where national self-interests need to balance out across a range of current issues, including world trade in agricultural and forest-derived commodities.

National and sub-national governments would need to know how much 'avoided emissions' they could provide, and at what cost. Summary data of this type would require appraisal of scenarios for integrating economic development and land cover change. Currently, such estimates are not available, although there have been some promising advances in the countries of Meso-America.

In an earlier phase of the discussions on clean development mechanisms, an inventory was made of 'abatement costs', largely in the energy sector (<http://www.adb.org/Documents/Reports/ALGAS/Summary/default.asp>). These results indicated that there was a fraction of 'hot air' – emissions that could be avoided at negative total economic costs, as they generate net economic costs at the societal level. There is also a range of emissions associated with moderate economic gain that could be offset at feasible levels of financial transfer. There is also likely to be a range of emissions associated with substantial economic gains that could not be offset under current carbon prices. Figure 1 presents a schematic view of these different

Figure 1
Schematic tradeoff between reduced greenhouse gas emissions through avoided deforestation and national economic development opportunities



types of avoided emissions, plotted in terms of economic benefits from carbon emission against the value of carbon. Also displayed across the top of Figure 1 is some of the policy options that countries might promote in order to achieve different levels and types of emissions.

For the avoided deforestation debate in tropical countries, there are, to our knowledge, no estimates available for the cumulative abatement costs (see Figure 1 for the indicative shape). As an extension of the ideas presented in this brochure, the ASB consortium for Indonesia is currently undertaking such an analysis for representative areas of Indonesia for the period since 1990.

National sovereignty on mechanisms

An effective mechanism for reducing carbon emissions through avoided deforestation would have related, but separate, mechanisms at the international and national levels. Between countries, political negotiations should be convened to establish commitments to baseline and target emission levels. Countries that attain superior performance in avoided carbon emissions through avoided emissions should be eligible for carbon offset payments or credits through multi-lateral or bilateral arrangements.

Within each non-Annex I country that voluntarily participates in the new REDD rules, there should be scope for flexible rules to create positive incentives for rural and forest-dependent people to benefit from more sustainable and clean development pathways. Such incentives would ensure the sustainability of the carbon stocks and reserve more of the country's national natural capital for the future. A number of countries have gained experience with such mechanisms already, and pilots exist elsewhere. Here we recommend that individual countries involved in the international mechanism should have the flexibility to meet avoided carbon emission targets through national mechanisms appropriate to their individual country conditions, following principles already established among Annex 1 countries.

Best practice is emerging on the types of national and local mechanisms that countries can apply to reduce carbon emissions from avoided deforestation, potentially with much lower transaction costs than current CDM projects. Incentive- and rights-based mechanisms can be put in place to reduce carbon emissions from avoided deforestation, while sustaining the asset base, rights and well-being of people dependent on those resources. Countries such as Costa Rica and Mexico already have substantial experience in implementing such mechanisms at the national and sub-national scale. Large-scale afforestation programmes, such as currently implemented in Indonesia, China and India, could be revised to better address avoided carbon emissions. Forest, landscape and watershed management projects can be revised to provide greater incentives to avoid carbon emissions through avoided deforestation. Case study evidence from across Asia and a pan-tropical synthesis show that realism, conditionality, voluntarism, and pro-poor are important criteria for evaluating the performance of incentive and rights-based mechanisms (www.worldagroforestrycentre.org/sea/networks/rupes).

http://www.cifor.cgiar.org/carbofor/_ref/home/index.htm; <http://www.worldagroforestry.org/es/default.asp>
<http://www.worldagroforestry.org/sea/Networks/RUPES/index.asp>; <http://www.asb.cgiar.org/>



A landowner (left) in North Lampung, Indonesia, discussing her perceptions of the benefits of reforestation of an Imperata grassland; Photo: Meine van Noordwijk

In Summary, during 2007 the global community should strive for:

- A global commitment to deal with emissions from deforestation and degradation in a coherent way through existing national accountability mechanisms,
- Assurance that rules with sufficient scope can deal with existing net emissions from land use and land cover change,
- New impetus to the international research community to improve the accuracy of full-system carbon accounting for the AFOLU sector and understand national-level tradeoffs between the foregone cost and value of carbon emissions,
- A basis for international benefit transfer to all countries that reduce emissions below agreed baseline levels – with the baselines to be further negotiated.

Futher Reading

2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Agriculture, Forestry and Other Land Use

<http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.htm>

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How this document was prepared

This document is an edited version of a formal submission to the UNFCCC by the World Agroforestry Centre (ICRAF) in March 2007. The submission was prepared by Meine van Noordwijk, Brent Swallow and Lou Verchot, with inputs from a wider group of staff from ICRAF and the Centre for International Forestry Research (CIFOR). Materials and lessons generated through the ASB Partnership for the Tropical Forest Margins were used to prepare the submission and this document. ASB partners are now exploring key issues related to avoided deforestation with sustainable benefits for Indonesia and other tropical forest countries. A side event will be organized at the Bali Conference of Parties to the UNFCCC.

References available through CIFOR

Available from <http://www.cifor.cgiar.org/publications/books>

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Murdiyasar, D.; Herawati, H. (Eds.) 2005. Carbon forestry: who will benefit? proceedings of Workshop on Carbon Sequestration and Sustainable Livelihoods, held in Bogor on 16-17 February 2005. CIFOR, Bogor, Indonesia. Viii, 215p. ISBN: 979-3361-73-5.

Murdiyasar, D.; Skutsch, M. (Eds.) 2006. Community forest management as a carbon mitigation option: case studies. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 125p. ISBN: 979-24-4660-5.

Murdiyasar, D.; Puntodewo, A.; Widayati, A.; van Noordwijk, M. 2006. Determination of eligible lands for A/R CDM project activities and of priority Districts for project development support in Indonesia. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 39p. ISBN: 979-24-4622-2.

About ASB

ASB is a well-established global alliance of over 80 local, national and international partners dedicated to action-oriented integrated natural resource management (iNRM) research in the tropical forest margins. It is the only global partnership devoted entirely to research on the tropical forest margins. ASB's goal is to raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services. ASB applies an integrated natural resource management (iNRM) approach to analysis and action through long-term engagement with local communities and policymakers at various levels.

About the World Agroforestry Centre (ICRAF)

The World Agroforestry Centre is part of The Alliance of the CGIAR Centres. We are an autonomous, not-for-profit research and development institution supported by over 50 different governments, private foundations, regional development banks, and the World Bank. The Centre was founded in 1978 to promote the exchange of information on agroforestry research in the tropics. In 1992, ICRAF joined the CGIAR and has, since, transformed itself into a world-class international agricultural research centre. We work to advance the science and practice of Agroforestry - to bring about an Agroforestry transformation in the developing world: a massive increase in the use of working trees on working landscapes by smallholder rural households that helps ensure security in food, nutrition, health, fodder, shelter and energy, income and a regenerated environment.

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ASB website: <http://www.asb.cgiar.org/>; ICRAF Southeast Asia website: <http://www.worldagroforestrycentre.org/Sea/>