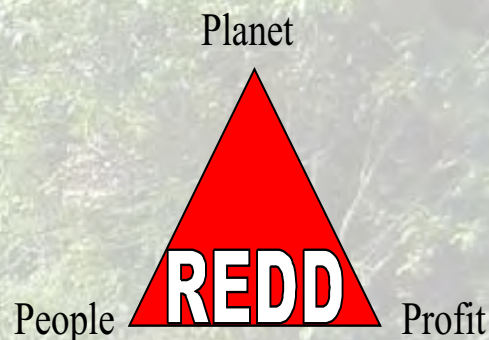


# Avoided Deforestation with Sustainable Benefits (ADSB) in Indonesia

## Avoiding or reducing emissions at the tropical forest margins: urgent, cost-effective but not easy

Global concerns over climate change have passed the 'tipping point'. Denial has become a rapidly declining minority voice. The human and political consequences of climate change are a threat to world peace, and new approaches are urgently needed. This was recently signalled by the award of the Nobel Peace Prize to scientific and popular advocates of the climate change issue. The Millennium Development Goals (especially 1 and 7 on poverty reduction and sustainable development) urge attention to climate change adaptation by the most vulnerable groups, and ask that mitigation measures do not, without appropriate compensation, exclude rural poor from land use options that could get them out of poverty. Much-needed innovative solutions on the interface of adaptation, mitigation and poverty reduction are still being tested. New mechanisms to Reduce Emissions from Deforestation and forest Degradation (REDD) may serve the 'triple bottom-line' of people, profit and planet. But is it so simple?



The United Nations Framework Convention on Climate Change (UNFCCC) was established to avoid the negative effects of human-induced climate change on humankind and the earth's ecosystems. Despite these intentions, evidence of climate change is accumulating. The existing mechanisms for emission reduction are not sufficient. Moreover, the Kyoto Protocol has fostered agreement by all major emitters on reduction targets or effective mechanisms to achieve such targets.

Although it has long been recognized that 'deforestation' accounts for about 20% of global emissions, in earlier negotiations parties could not agree on ways to include incentives for this type of emission reduction in global carbon markets. In this series of research briefs for policymakers, we will review the obstacles to creating an effective REDD mechanism, and see how much progress has been made using examples from Indonesia, the country with the highest land-use based CO<sub>2</sub> emissions.

Issue	Why was no agreement reached five years ago on avoided deforestation?	Why do we think it can be resolved now in the form of REDD?
International relations	-- See ADSB Research Brief <b>Avoided</b>	
Technical aspects	-- See ADSB Research Brief <b>Deforestation</b>	
Development benefits	-- See ADSB Research Brief <b>Sustainable</b>	
Relation to long term UNFCCC objectives	-- See ADSB Research Brief <b>Benefits</b>	

### Key points of this brief

Dealing with CO<sub>2</sub> emissions from forest conversion and other land use change in tropical developing countries is

- *Urgent*, as total emissions are substantial (Indonesia has 50% of the emissions of the USA)
- Potentially *cost-effective* as a large share of current and past emissions have brought only small economic benefits of less than 1 \$/t CO<sub>2</sub>e. Many current investments in emission reduction cost ten times as much, or more; and
- *Not easy* because there are many stakeholders and actors involved, and several layers of government. Early pilots suggest high transaction costs unless international regimes are kept *simple* and *transparent*.

## 1. Urgent

Indonesia is now considered to be the third largest emitter of CO<sub>2</sub> and the largest emitter from 'agriculture, forestry and other land uses' (AFOLU), although the data has a large margin of uncertainty and details are contested. The largest share of these emissions derive from degradation of peatlands, land clearing fires and increased fire impact due to prior drainage. This not only leads to CO<sub>2</sub> emissions, but also to haze with its direct health and economic impacts. Emission reductions can have multiple benefits if done well.



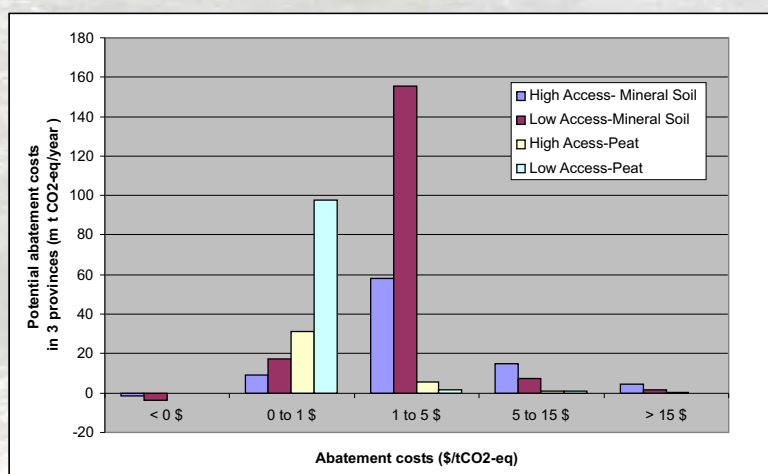
**Table 1.** GHG emission summary in Mt CO<sub>2</sub>e (PEACE, 2007 from various sources)

Emission sources	United States	China	Indonesia <sup>1</sup>	Brazil	Russia	India
Energy	5,752	3,720	275	303	1,527	1,051
Agriculture	442	1,171	141	598	118	442
Forestry and peatlands	-403	-47	2,563 <sup>2</sup>	1,372	54	-40
Waste	213	174	35	43	46	124
<b>Total</b>	<b>6,005</b>	<b>5,017</b>	<b>3,014</b>	<b>2,316</b>	<b>1,745</b>	<b>1,577</b>

1. Total emissions may in fact be anywhere between 1.5 and 4.5 Gt CO<sub>2</sub>e per year; a further investment in data collection is needed to reduce this uncertainty margin,
2. A significant part of the peatland emissions may in fact belong to the 'agriculture' domain. Therefore to be efficient, REDD scheme needs to consider this domain in defining eligibility.

## 2. Cost effective

Our analyses show that three provinces in Indonesia together have been emitting several million tons of CO<sub>2</sub> per year, for activities that yield negative, \$0-\$1, or \$1-\$5 per t CO<sub>2</sub>e. This is based on analysis of actual land use change in the three provinces of East Kalimantan, Jambi and Lampung (jointly 16.2% of Indonesia), in the period 1990-2005, combined with estimates of the economic profitability (Net Present Value, see earlier ASB Policy Briefs) and time-averaged carbon stocks of the land uses. With current emission reduction efforts costing \$10 per t CO<sub>2</sub>e, there is potential for substantial gains for 'buyers' who might get cheaper carbon emission reduction credits. Meanwhile, 'sellers' can get substantially more than their current 'opportunity costs' if there is space for transaction costs, monitoring and capacity building.



**Figure 1.** Volume of annual CO<sub>2</sub> emissions that was generated by actual land use change in three provinces in the period 1990-2005, separated by accessibility and soil category; the total equals 16% of the 2.5 Gt CO<sub>2</sub>e estimated for Indonesia as a whole

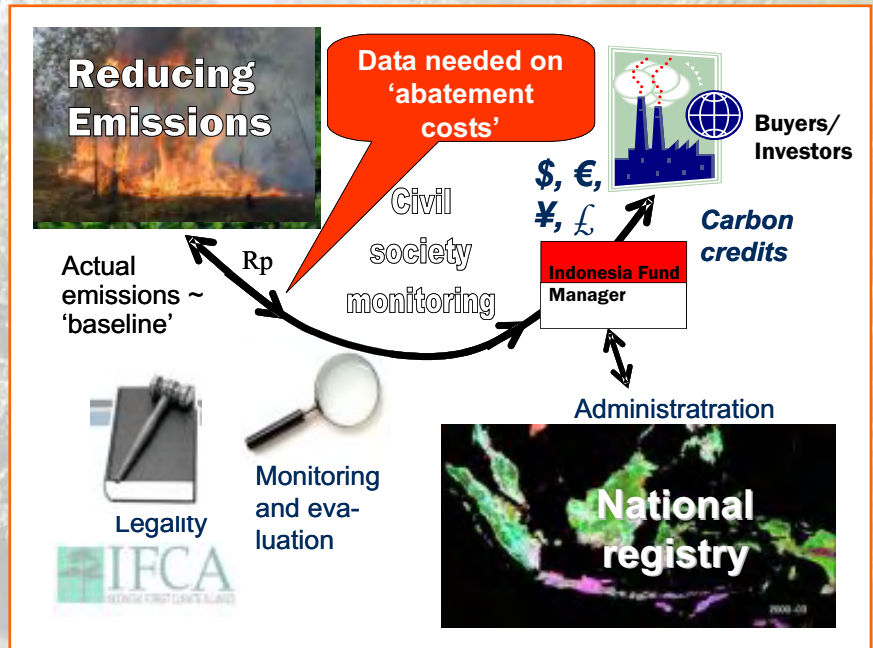
Total value of this market may well reach billions of dollars for Indonesia, even if only 1/3 of recent emissions of 3 billion t of CO<sub>2</sub> can be reduced at a low price of a few \$/t CO<sub>2</sub>e.

### 3. Not Easy

Controlling transaction costs is the key issue. Afforestation/reforestation CDM efforts have shown that transaction costs are high if the rules are complex. Yet, activities have to directly reduce emissions, provide for sustainable alternatives, and address concerns about additionality, leakage and permanence. This requires efficient linkage of local to national scales and smooth cooperation between agencies dealing with rural development, forestry and environment and financial flows.

Exploration of the 'added value' across the local to national scale by IFCA (Indonesian Forest Climate Alliance) suggests that different parts of the system will have to play different roles. Inter-agency cooperation tends to have

high transaction costs, unless there is strong political will to secure such cooperation at the highest level. Carbon markets are very clearly aware of 'risk' as they are selling commodities that will help meet emission reduction targets at the end of a commitment period. Unless these credits can be delivered, the investment has no return. Risks of non-delivery are based on lack of performance on the ground as well as risks of non-delivery in the subsequent administrative approval steps. A sound and transparent monitoring systems should be developed and implemented jointly. It is here that Indonesia as a country will have to build trust and show that it has a credible system in place. It can be done, even if it is not easy.



**Figure 2.** Elements of a carbon credit system

**Table 2.** Roles required at different levels to jointly produce emission reduction and as credible evidence of reductions, so that 'credits' can be awarded

Value addition	Emission reduction activities	Provision of alternative livelihoods	Prevention of leakage	Proof of additionality, above business as usual baseline	Dealing with permanence concerns (registry)	Accountability for changes in C stocks (Tier3)	Independent verification of emission reduction
Scale							
International					+		*
National (government and national NGOs)					*	*	+
Intermediate (province and district scale government, large-scale industries)		+	*	*	+	+	
Local actors (companies, communities, forest farmers, local NGOs)	*	*				+	
Estimated share (%) in C <sub>REDD</sub> production costs (tentative)	35	35	5	5	5	10	5

\* Primary responsibility

+ Support role

Source: IFCA architecture study 3 (2007)



There are two main options to link international carbon investors and buyers of credits to local action: directly (left) or indirectly (right) via a number of steps in government institutions. On the left the main challenges are ways to deal with leakage, additionality and permanence, that require higher-scale functions. On the right the main challenges are transaction costs, complexity and corruption.

### Issues surrounding international incentives for forms of 'avoided deforestation'

Issue	Why was no agreement reached five years ago on avoided deforestation?	Why do we think it can be resolved now in the form of REDD?
<b>International relations</b>		
1. Sovereignty, interference with development	Developing countries did not want to forego opportunities for economic development and many resisted foreign influence on the way they manage their lands	A substantial part of emissions is associated with activities that have negative or only small positive economic benefits; bottom-line mechanisms will maintain national sovereignty and avoid loss of control
2. Trust	Low level of trust and social capital between the various parties at the negotiation table and associated civil society, strong signals that vested interest rather than shared responsibility for global climate dominated positions	The articulation of non-energy emission sources and the international agenda have created enough pressure on many countries with significant emissions from AFOLU to address the issue seriously; lack of trust is still a limiting factor
Technical aspects -- See ADSB Research Brief <b>Deforestation</b>		
Development benefits aspects -- See ADSB Research Brief <b>Sustainable</b>		
Relation to long term UNFCCC objectives -- See ADSB Research Brief <b>Benefit</b>		

This is the second of a series of four research briefs prepared in 2007 in the context of UNFCCC COP-13 (Bali) on:

**A**voiding or reducing emissions at the tropical forest margins: urgent, cost-effective but not easy

**D**eforestation: will agroforests fall through the cracks?

**S**ustainable, efficient and fair: can REDD be all three?

**B**enefits, but not everybody will win

#### In Indonesia

Further information on the ASB Partnership for the Tropical Forest margins can be found at:

[www.asb.cgiar.org](http://www.asb.cgiar.org); see also [www.worldagroforestrycentre.org](http://www.worldagroforestrycentre.org) and [www.cifor.org](http://www.cifor.org)

E-mail: [m.vannoordwijk@cgiar.org](mailto:m.vannoordwijk@cgiar.org); [s.dewi@cgiar.org](mailto:s.dewi@cgiar.org); [b.swallow@cgiar.org](mailto:b.swallow@cgiar.org);

[H.purnomo@cgiar.org](mailto:H.purnomo@cgiar.org); [d.murdiyarso@cgiar.org](mailto:d.murdiyarso@cgiar.org)

#### How this document was prepared

This document combines analyses by ASB-Indonesia of land use change in three provinces of Indonesia with an 'issue paper' prepared for the Indonesia Forest Climate Alliance (IFCA) by ICRAF & CIFOR scientists



Partnership for the Tropical Forest Margins



World Agroforestry Centre  
TRANSFORMING LIVES AND LANDSCAPES



Indonesian Agency for Agricultural Research and Development (IAARD)



Universitas Brawijaya