

Tropical Forests and Climate Change Mitigation

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The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment report highlights the role of tropical forests in mitigating the negative consequences of climate change. Initial results from Alternatives to Slash and Burn Partnership (ASB) study suggest that the abatement costs of alternative land uses are reasonable.

Introduction

Tropical forests are among the most valuable ecosystems in the world for many reasons. Although covering less than 10% of the earth's land area, they provide 800 million people with fuel,

food, and income (Chomitz, 2007). They harbor the largest terrestrial reservoir of biological diversity, from the gene to the habitat level. For example, more than 50% of known plant species grow in tropical forests (Mayaux et al. 2005). They help regulate climate by storing vast amounts of carbon.

In spite of their recognized importance, tropical forests are undergoing rapid land use changes including deforestation. Sathaye et al. (2007) estimate that deforestation rates will continue in all regions with high rates in Africa and South America, for a

total of just under 600 million ha lost cumulatively by 2050.

This trend has adverse impacts on biodiversity resources, water resources, rural livelihoods and of course in climate regulation. Thus, reducing deforestation remains a high-priority mitigation option within tropical regions

IPCC's Findings

Avoiding deforestation. Initial studies indicate that the largest potential is in avoiding deforestation and enhancing afforestation and reforestation.

Reforestation and afforestation. These offer the second largest potential to mitigate climate change through enhanced carbon sequestration. The assumed land availability for afforestation options depends on the price of carbon and how that competes with existing or other land-use financial returns, barriers to changing land uses, land tenure patterns and legal status, commodity price support, and other social and policy factors.

Cost estimates. The cost for carbon sequestration projects in different regions show a wide range; from US\$ 0.5 to US\$ 7/tCO₂ for forestry projects in developing countries, to US\$ 1.4 to US\$ 22/tCO₂ for forestry projects in industrialized countries (Cacho et al., 2003; Richards and Stokes 2004).

Carbon credits. At the 2007 Bali Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC), one of the main topics discussed was the

possibility of including carbon credits from avoided deforestation (otherwise known as Reducing Emissions from Deforestation and forest Degradation or REDD) under a post-Kyoto regime.

Recent analysis suggests that the design and implementation of REDD will be difficult given the complexity of the social, economic, environmental and political drivers of deforestation (Kanninen et al., 2007).

ASB was established in 1992 and became fully functional in 1994. The goal of ASB is now to “raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.”

The ASB study helped address the question: could emitting carbon dioxide from land use changes have been reduced if farmers had considered carbon values in their economic decision making?

The answer is a qualified yes. Over the last 20 years, the five sites in this study have emitted huge amounts of carbon. Three land-use change transitions stand out for special attention: (1) logging and subsequent conversion to extensive production of annual crops in sparsely-populated areas of Indonesia (East Kalimantan), Peru (Ucayali) and Cameroon (Awa); (2) conversion of forests to simple coffee systems in Lampung; and (3) conversion of peat forests in Jambi province.

The results suggest a number of significant technical challenges for the design of REDD mechanisms. First, the mechanisms must provide rewards that will be consistent with overall carbon management at the landscape and national scales. Forestry agencies should consider forest resources across the landscape, and not be bound by arbitrary definitions of what is or what is not a forest. They should also not be given incentive to protect a few intact forest blocks to the neglect of forest resources elsewhere in the landscape. Secondly, there is a need to target carbon conservation incentives to areas at greater risk of future deforestation.

Synthesis

Tropical forests are vital in addressing climate change. Tropical deforestation which contributes 20% to global greenhouse gas emissions must be curtailed. Enormous challenges remain, but there are initial indications that avoided deforestation (REDD) is possible at acceptable costs. The Stern Review (2006) states that there is evidence that action to prevent further deforestation would be relatively cheap compared with other types of mitigation, if the right policies and institutional structures are put in place.

