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## **GLOBAL CHANGE AND THE DESTRUCTION OF THE AMAZON RAINFOREST**

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Brazil's Amazon rainforest is rapidly being destroyed: recent satellite data indicate an upsurge in deforestation rates beginning in 2002 and planned infrastructure implies stimulating clearing in previously inaccessible parts of the region. The growing economic strength of soybean and beef exports increases the pressure for infrastructure expansion and the profitability of clearing. However, pastures degrade and the landscape left behind fulfills neither the environmental role of the rainforest nor the economic role of the pasture. While the strength of the forces leading to forest destruction must be recognized, they in no way justify a fatalistic acceptance of deforestation continuing until the last tree is cut.

Deforestation has severe environmental impacts on all levels from local to global. Brazil is the country that will suffer most if the Amazon rainforest is destroyed. The severity of potential impacts represents a key to maintaining the forest, as these impacts give substantial value to avoiding deforestation. Tapping the value of the environmental services of the forest offers the prospect of an alternative basis for the region's economy. Instead of being based on destroying the forest, as it is today, the human population could be supported by maintaining forest for the environmental services it provides.

Biodiversity is obviously lost when tropical forest is cut and burned. This loss fundamental to the willingness of people in other parts of the world to pay something to avoid Amazonian deforestation, even though they have no direct contact with the rainforest. Despite the importance of tropical forest carbon stocks to global warming, the same amount of carbon stocked in, say, a plantation of Eucalyptus does not lead to the same level of interest in deforestation as an environmental issue. The loss of human cultures when tropical forest areas are replaced by cattle pasture is an additional impact that is not translatable into monetary value. While these reasons for maintaining forest are important, it is the role of the forest in climate change that offers the best prospects of justifying monetary flows on the short term that are on a scale compatible with the challenge of controlling forest destruction.

The hydrological cycle in Amazonia and in most of the remainder of Brazil is dependant on water vapor that has been recycled through the Amazon forest. During the rainy season in São Paulo up to 70% of the precipitation is water that has come from Amazonia. Transformation of the forest into cattle pasture greatly reduces the amount of water returned to the atmosphere though evaptranspiration, and consequently threatens

already-insufficient supplies of water for electricity generation and human consumption in the major cities of the central-south region of Brazil.

Amazonian deforestation is a significant source of greenhouse gas emissions today, and the large amount of remaining forest means that the potential for future emissions is much greater than in other tropical areas. The amounts of carbon involved are astronomical, notwithstanding controversies over data on biomass and other parameters for estimating emissions, over how to calculate emissions, and over what these emissions mean in terms of policies for combating global warming. As a result of political compromises reached in 2001, avoided deforestation is excluded from credit under the Kyoto Protocol's Clean Development Mechanism until 2013. After then the chances of this becoming eligible for credit are much better than they were during the earlier rounds of negotiations.

Climate change threatens the future survival of the Amazon rainforest. Modeling results from the Hadley Center of the UK Meteorological Office indicate catastrophic forest dieback by 2080 if global emissions of greenhouse gases continue without mitigation. However, this dieoff can be averted if the atmospheric concentration of CO<sub>2</sub> is held below 550 ppmv. In 2005, negotiations under the Climate Convention will define what is considered a "dangerous level" of CO<sub>2</sub>.

As in the case of efforts to slow deforestation in the face of powerful forces, fatalism is not an appropriate reaction. Unfortunately, some have seized upon projected climate changes as a reason to write off Amazonian forests as a means of mitigating global warming. Instead, the fate of the forest depends on human decisions. These decisions include global change both through the bounds placed on atmospheric concentrations of greenhouse gases and through the willingness to use avoided deforestation as part of the effort to combat the greenhouse effect.

A proposal for a new mechanism to implement avoided deforestation mitigation efforts in the Amazon before 2013 was made in Milan in December 2003 by the Institute for Research in Amazonia (IPAM) in a side event at the Conference of the Parties to the climate convention. The "compensated deforestation reduction proposal" would only generate credit after 2013, but the activities and the deforestation reduction on which the credit would be based would begin much earlier. Not waiting another nine years to begin action on the scale that could be implemented as a part of international efforts to combat climate change is critical to the fate of the forest both because of the ongoing rapid pace of forest destruction and because of the need for economic motivations to avoid setting processes in motion that lead to long-term increases in the yearly rate of deforestation.