

## Tropical Forest, Deforestation and Climate Change: The Amazon Case

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### Introduction

Tropical forests are giant reservoirs of carbon that must remain largely intact if we want to bring global warming under control (IPCC 2007, Stern Review 2006 ). Around 200 PgC are stored in the tropical forests that cover the planet (IPCC 2007). However, during the 1990s and, as a consequence of deforestation, this carbon has been released as CO<sub>2</sub> - a potent greenhouse gas – GHG - to the atmosphere at the rate of approximately of  $0.8 \pm 0.2$  to  $2.2 \pm 0.8$  PgC per year (10 - 35% of global carbon emission), (Houghton 2005, Achard et al. 2002, DeFries et al. 2002, Table 1).

Only in Brazilian Amazon, deforestation during the last decade released 0.2 PgC/year (3% of global total) (Houghton 2005), representing 70% of total Brazilian emission (carbon emissions from burning fossil fuels in Brazil represent ca. 0.09 PgC/year; reference year 2002. Santilli et al., 2005). Also, emissions from human-caused tropical forest fire can double these emissions in years of extreme drought (Nepstad et al. 2002).

The rate of Amazon deforestation was 18,165 km<sup>2</sup> during the 90's and 19,289 km<sup>2</sup> during the 2000's with a peak in 1995 (29,059 km<sup>2</sup>) and 2004 (27,379 km<sup>2</sup>) (INPE/PRODES. 2007). An area equivalent to France territory (ca. 645 000 km<sup>2</sup>) is already deforested and converted, particularly, to pasture (Figure 1). The deforestation rates of Brazil alone would result in GHG emissions equivalent to 40% of the annual reduction goals for industrialized countries listed in the Annex I of the Kyoto Protocol (Santilli et al. 2005, Moutinho & Schwartzman 2005, Table 1).

Recent studies demonstrated that Amazon deforestation will increase in the coming decades. The estimative is that 32 PgC will be emitted into the atmosphere by 2050 if deforestation follows the trend of the last two decades (Soares et al. 2006, Figure 2). The scenarios for increasing emissions in other tropical countries are similar. In Indonesia, for example, 17,000 km<sup>2</sup> of forests were cut down between 1987 and 1997 and 21,000 km<sup>2</sup> in 2003, adding another 0.2 PgC/year to atmosphere (Houghton et al., 2003).

There is now a consensus in the international community that to avoid “dangerous interference” in the global climate system—the primary objective of the United Nation Framework Convention on Climate Change (UNFCCC, article 2)—tropical deforestation should be greatly reduced. The Kyoto Protocol, although an

important step for reducing GHG emissions, has no means of addressing tropical deforestation. In order to ensure that atmospheric CO<sub>2</sub> concentrations remain below 450 parts per million by volume (ppmv) by 2100 and to avoid "dangerous interference," annual global emission reductions must be greater than 2 % per year starting in 2010. Given the inertia of global power consumption and costs of changing the energy matrix, it is likely for both developed and developing countries that large emission reductions (>2 percent per year) from fossil fuels will be unrealistic in the short term. Reductions in tropical deforestation, however, may be a bridge to technological transformation, offering a viable, cost-effective means by which to begin reducing GHG emissions before the technology needed to transform the energy and transportation sectors globally is developed.

Responding to the urgency to reduce emission from deforestation, the UNFCCC-COP 13 in Bali in late 2007 determined a two year process to design the new climate change international framework agreement post 2012 - "The Bali Road Map" - that includes Reduction Emission from Deforestation and Degradation (REDD) by the end of 2009 (COP 15). This approved "Road Map" in Bali represents the most important moment to qualify the REDD debate, finding the best alternative framework to implement REDD regimes under the UNFCCC throughout the next two years.

This paper introduces the importance of tropical forest and its deforestation to climate change, with emphasis on Brazilian Amazon. In addition, it is presented some political aspects involving the Brazilian position and proposals to reduce emissions from deforestation under the UNFCCC context and perspectives for post-Kyoto agreement (post-2012). Finally, it is explained some fundamental opportunities and barriers to implementation of mechanism of compensation for deforestation reduction in Brazil.