Fearnside, P.M. 1987. **Summary of Progress in Quantifying the Potential Contribution of Amazonian Deforestation to the Global Carbon Problem.** Proceedings of the Workshop on Biogeochemistry of Tropical Rainforests: Problems for Research.

This article reviews previous estimates of the contribution of Legal Amazon forests to atmospheric carbon. Accurate information of the impacts from complete deforestation is necessary to give decision makers the information they need to judge whether taking action to contain deforestation is worth the financial and political cost. Consequently, this paper focuses on clarifying and addressing the latest information on carbon releases and sinks from the Legal Amazon.

Most of the Legal Amazon forest is dense tropical forest. According to Fearnside, previous estimates of the biomass contained in dense tropical forests by Lugo and Brown (among others) have been too low. Fearnside's measurements show much higher levels of dense forest biomass, producing higher carbon releases from deforestation than previously anticipated. The reliability of estimating the biomass levels of dense tropical forest will have the greatest impact on final estimates of carbon released from the Legal Amazon forests.

According to Fearnside, the timber volumes method for estimating biomass is not adequate. It results in biomass values that are too low. Direct measurements show twice the amount of biomass than estimates using the timber volume method.

Fearnside uses measurements in 19 localities within Legal Amazon to determine a total volume of biomass for Legal Amazon. The average biomass from his calculations is 254.5 metric tons/ha. This gives a total carbon store (using 0.45 coefficient for conversion of biomass to carbon) of 45.34 G tons carbon or 50.38 G tons of carbon using Brown and Lugo's 0.50 conversion rate. Data presently being collected by the World Wildlife Fund, INPA and Rankin should improve the accuracy of these figures. There are an additional 64.54 G tons of carbon in the soil.

Pasture biomass estimates produced by Fearnside are also higher, and estimates of the total biomass released from pastures declines very little (3.4%) from previous estimates. Using the higher biomass to carbon coefficient of 0.50, non-natural vegetation, such as secondary forests, contain higher amounts of carbon.

Fearnside discusses potential carbon sinks in the region that have been identified as additional absorbers of carbon. In previous studies charcoal produced from burning has been over-estimated as a sink. Pasture charcoal is negligible in the short-term. Carbon fixing by regeneration of secondary forests has also been over-estimated in the past by claiming that secondary forests store 50% of the original carbon levels. Fearnside's revised estimate has complete regeneration by secondary forests storing carbon at only 15% of that of the original forest.

CO_2 fertilization is discounted by Fearnside as a inadequate carbon sink. Plants are often limited in their growth by the lack of other nutrients, water and sunlight. Additional CO_2 in the atmosphere will only increase growth and carbon uptake a minimal amount. Climate changes from greenhouse gas concentrations could also alter the environment to reduce growth rates of plants. Finally, carbon deposited as litter and buried in sediments is not an important sink of carbon in the Legal Amazon. Most carbon in the rivers is from the Andes, not from the forests. Carbon is in a dissolved, not particulate state, and is in small concentrations compared to the amount of carbon released from deforestation. Much of the carbon washed away from burn sites, etc. would remain exposed to oxidation.

Fearnside concludes by claiming that 49.7 G tons C is the best present estimate of the longterm release of carbon from converting the Legal Amazon to cattle pasture, an amount 20% lower than his previous estimate.

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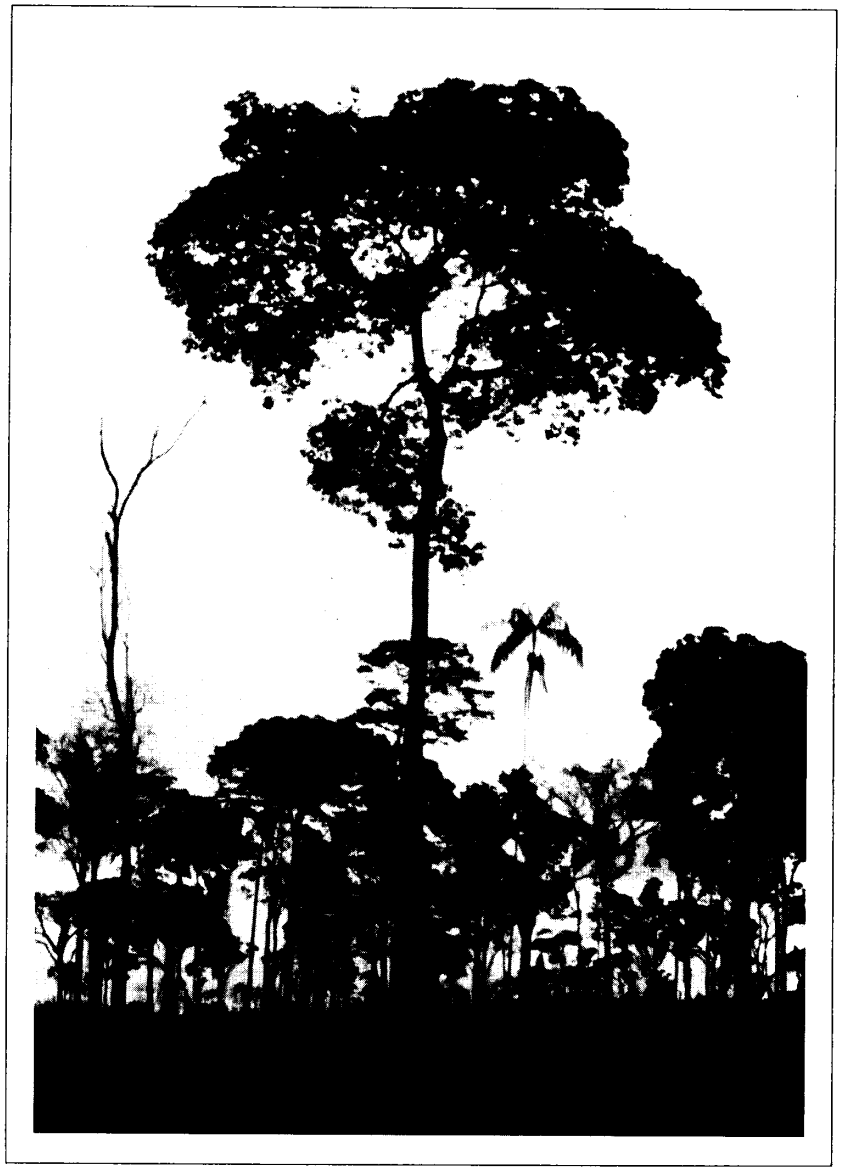

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