**Philip M. Fearnside, INPA, Brazil. 1989. "Contribution To The Greenhouse Effect From Deforestation In Brazilian Amazonia."**

Brazil emits 100 million metric tons of carbon annually from burning fossil fuels, and may emit 270 million metric tons from deforestation in the legal Amazon region. The economic benefits from the fossil fuel are substantial, while the benefits from deforestation are minimal.

The "legal Amazon" covers about 60% of Brazil. For most of this area, the natural vegetation is closed forest; the rest is savannah (open woodland). The following parameters are best estimates for the legal Amazon region of Brazil. They are based on several studies made of satellite data for various parts of the region.

| | | |
|---|---|---|
| A. | Total area of legal Amazon: | 5,000,000 $km^2$ |
| B. | Area originally covered by closed forest: | 4,500,000 $km^2$ |
| C. | Closed forest area cleared through 1988: | 345,000 $km^2$ |
| D. | Closed forest area cleared from 1960 through 1988: 268,000 $km^2$ | |
| E. | Percent of original closed forest cleared = C/B x 100 = | 8.2% |
| F. | Percent of original forest cleared recently = D/B x 100 = | 6.4% |
| G. | Area originally covered by savannah woodland: | 1,000,000 $km^2$ |
| H. | Area of savannah woodland cleared, 1960 through 1988: 192,000 $km^2$ | |
| I. | Percent of savannah woodland cleared, (1960-1988): | 19% |
| J. | Percent orig. forest + savannah cleared, '60 thru '88: | 9.6% |
| K. | Area of closed forest cleared in 1988: | 20,000 $km^2$ |
| L. | Area of savannah woodland cleared in 1988: | 19,000 $km^2$ |
| M. | Total forest + woodland cleared in 1988 in legal Amazon: | 9,000 $km^2$ |
| N. | Area of Switzerland (for comparison): | 39,770 $km^2$ |
| O. | Current area covered by closed forest: | 4,196,000 $km^2$ |
| P. | Carbon in biomass on closed forest area (metric tons): | 53 x $10^6$ |
| Q. | Current area covered by savannah woodland: | 576,000 $km^2$ |
| R. | Carbon in biomass on savannah woodland area (metric tons): | 41 x $10^6$ |
| S. | Net carbon released from conversion of 39,000 $km^2$ of forest and woodland in 1988 (metric tons): | 270 x $10^6$ |

The rate of deforestation in the legal Amazon region of Brazil has climbed steadily since the inauguration of the Transamazon Highway in 1970. The only recent exception in the steady increase in deforestation area may have been 1989, when substantially more rain fell than is usual for the dry season, making the forest difficult to burn -- an important step in forest and woodland clearing. Many greenhouse effect calculations have used the deforestation rate data for 1980 published by FAO. Brazil forest dominated those data, and the deforestation estimate for Brazil was probably an underestimate even then. As the rate has been climbing steadily since, many of the former calculations are made obsolete by these newer deforestation estimates.

Most of the deforestation in the legal Amazon is done to create cattle pastures. These last only about a decade, after which they are not productive. The subsequent vegetation on the sites has a higher biomass than pasture, but a much lower biomass than forest. Degradation of the soil after deforestation leads to low biomass climax vegetation, an effect that is expected to be exacerbated by rainfall changes expected to result as deforestation continues to expand greatly.

United States Environmental Protection Agency

Brazilian Institute For The Environment And Renewable Natural Resources

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# Tropical Forestry Response Options To Global Climate Change

## Conference Proceedings Sao Paulo, January 1990

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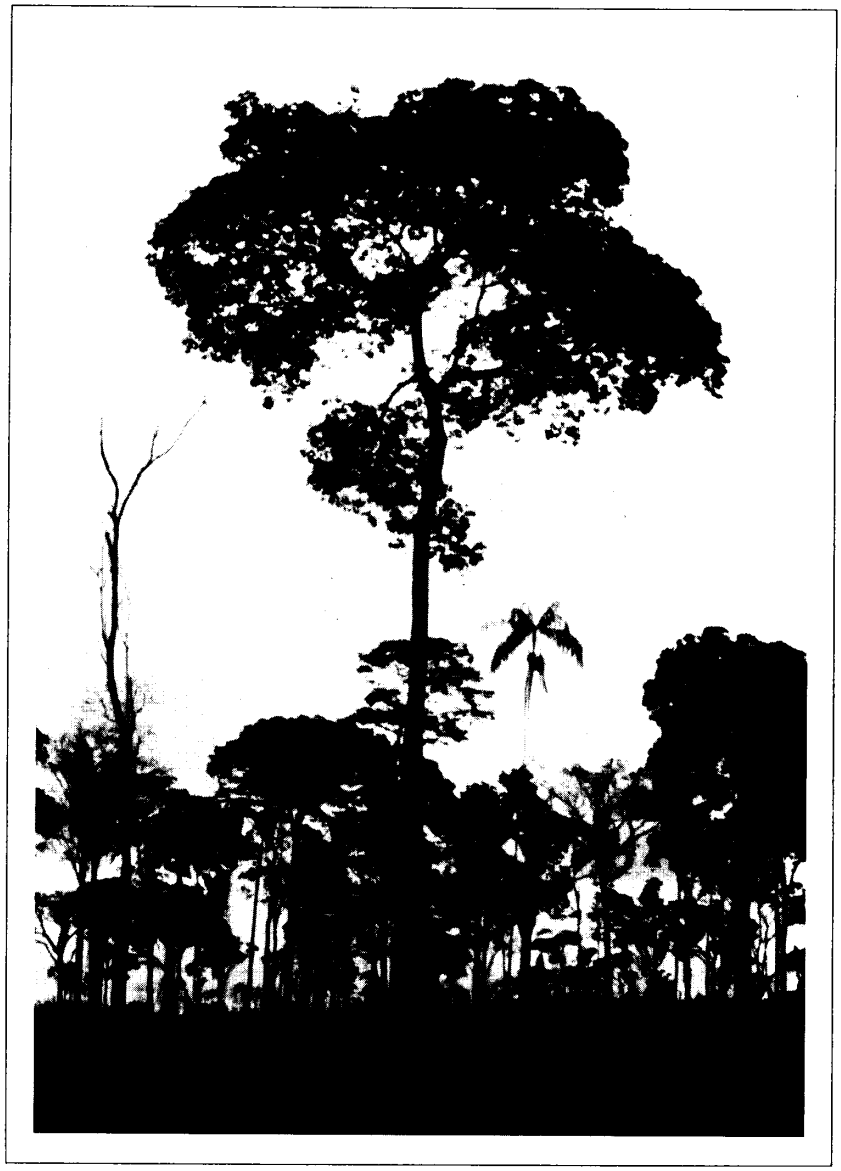

Intergovernmental Panel On Climate Change
Response Strategies Work Group
Subgroup On Agriculture, Forestry And Other Human Activities