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## WOOD PROJECT/IMAZON

### INTRODUCTION

The opening of the Amazon frontier began 25 years ago with the building of roads into the forest. Once the roads were opened, colonists started to arrive. But for various reasons, such as the lack of infrastructure, the absence of reliable credit, and infertile soils, the colonization process stalled. Cattle ranchers composed a second wave of occupation. Ranchers also confronted problems of poor soils, pests and poorly adapted germplasm and, in spite of government incentives, have generally not enjoyed economic success.

With the poor performance of these two pioneer groups we might expect the stagnation of the Amazon frontier, but a new economic activity has come to the fore--logging. Lumber production in the Amazon in 1976 was 4.5 million m<sup>3</sup> (14% of all lumber production in Brazil). By 1987 lumber production increased to 24.6 million m<sup>3</sup> (54% of Brazil's total).

The significant increase in logging activity in Amazonia results, in part, from the depletion of forest wood stocks in the south of Brazil. Moreover, the depletion of timber resources in the tropical forests in Asia, which supplies the bulk of the international lumber trade, could create an increased demand for Amazonian lumber. Hence, we may be just at the beginning of a major logging era in Amazonia.

### GOALS

The goals of IMAZON's Wood Project are to: 1) fully document the impacts of logging in the eastern Amazon; 2) evaluate the potential of alternative systems of forest timber management; and 3) evaluate and interpret existing forest-use legislation while developing logging guidelines based on empirical field studies.

## PHASE 1. DOCUMENTATION OF LOGGING ACTIVITY AND IMPACTS

Little is known about logging activities in eastern Amazonia. Indeed, there is no other major project in all of Amazonia studying logging impacts. Future policies, if they are to be good ones, will require a good information base. Hence, we have come to see our first mission as that of conducting rigorous research on logging impacts to provide high-quality and relevant information to scientists, policy makers, and other leaders.

In studying logging in different areas of the eastern Amazon, we are organizing the research around three major themes: 1) who owns or controls the forest resource (i.e., timber); 2) who is involved with harvesting and processing the forest resource; and 3) what impact does harvesting have on the forest itself. The answers to these basic questions help us define which actors to study and in what ways. Through all this we see economic studies as essential in order to understand the economic basis of logger behavior. With understanding, will come the power to develop strong economic arguments of our own, based on alternative approaches to forest use.

The study of the ecological impacts of logging will also receive special emphasis. Here, we wish to determine the amount of forest damage that is associated with logging and then to develop ways to minimize this damage. This is relevant given the present regulatory environment, wherein RIMA or "Environmental Impact Statements" must be filed and evaluated for all large-scale logging operations. At present there are no objective criteria which can be used to judge if a given logging operation is harmful.

IMAZON'S Wood Project should be in a position to develop these criteria. Such criteria or indices would have to be relatively easy to measure and biologically meaningful. One possibility would be to establish a series of ratios (e.g., m<sup>2</sup> of wood harvested per m<sup>2</sup> of logging road, tons of slash left in forest vs tons of wood harvested, percentage of canopy opened vs percentage of volume harvested; volume harvested vs volume damaged, and so on) and, then, based on our field studies, establish, empirically, the limits beyond which values for these ratios become unacceptable (i.e., would result in ecological damage and significant economic losses). We will soon have the information

necessary to make a major contribution in this area. In short, by working at the Interface between Industry and IBAMA (the Brazilian Forest Service), we believe that much can be done to develop rational logging guidelines in Amazônia that take into account IBAMA'S limited resources and field personnel.

## PHASE 2. ALTERNATIVE SYSTEMS OF FOREST MANAGEMENT

It is not enough to critically examine ongoing forest extraction processes--acceptable alternatives must also be sought. Although only one hectare of rainforest in 35,000 is managed properly (Wadsworth 1987), we believe that there are technically simple procedures of forest management that would lead to a more desirable pattern of forest regeneration following selective logging than that which results from the current approach of simple neglect. Foresters at CPATU (Humid Tropics Center for Resource Use) have been studying alternative forestry systems in the Tapajos National Forest near Santarem for almost a decade and SUDAM (Amazon Superintendency for Development) has taken over a FAO forestry station at Curua Una, also in the Central Amazon. In addition, CURD has initiated intensive natural forestry management approaches at two Amazonian sites (Maraba and Trombetas) and the Jari enterprise has nearly two decades of data on plantation forestry in the Amazon.

We are conducting a comparative quantitative analysis of alternative logging and forest management approaches using the available data from the ongoing research together with data that we collect ourselves. In this search for alternatives, we will consider biological questions (e.g., damage done during logging, effects on wildlife, nature and rate of regeneration, etc.), social questions (land titling needs, public infrastructure requirements), and economic questions (costs involved in logging and management, incentives required to initiate management; marketing strategies, etc.).

## PHASE 3. POLICY ANALYSIS

While AMAZON'S Wood Project will provide a good empirical base for understanding and evaluating logging impacts in Amazonia, there is a great gap between this field knowledge and its application at the policy level. With the completion of Phases 1 and 2, we will

rigorously analyze : 1) the quality and effectiveness of existing forest legislation in Amazonia; 2) the bureaucratic structure, decision making process and budget allocation within key agencies involved with forest regulation in Amazonia; and 3) the structure of forest regulation at the field level.

Forest regulation occurs at both the federal and state level. Recently, officials of IBAMA (agency responsible for monitoring logging practices) and SESPA (state agency responsible for licensing logging operations--providing permits, etc.) have begun to organize the existing forest legislation, complete with countless amendments, into an accessible format. Much of the law appears to be the work of very unenlightened land managers. Restrictions are too stringent in some areas, absent where they should be present in other cases, and without biological underpinnings in still other instances. Moreover, there are many loopholes in the law that need to be eliminated. We will evaluate the law item by item from both biological and social perspectives.

We will also profile the organizations that are responsible for the elaboration and enforcement of forest regulations in Amazonia with particular emphasis on the State of Pará. These organizational profiles will include information on organizational structure, policy, decision making process, effectiveness, and linkages. Using the information obtained from these organizational profiles, a policy map will be constructed showing the relationships between the various state and federal organizations involved in Amazonian forest use. This will allow us to elucidate areas of overlap in jurisdiction and implementation and areas where jurisdiction and implementation are lacking. Moreover, an in-depth evaluation of the structure, operating procedures, and effectiveness of these organizations should be immensely useful to the organizations themselves, to policy makers in other agencies, and to NGOs wishing to influence the regulation and enforcement process.

Overall, AMAZON can make an important contribution in the policy arena precisely because we are independent and have a clear research mission. Indeed, by providing empirical information on the economic, social, and ecological implications of logging, AMAZON should be able to act between IBAMA and private industry to evaluate and interpret the existing legislation, suggest modifications, deletions, or additions, as appropriate, while developing logging guidelines based on empirical field studies.