

JARI AND CARAJÁS:

THE UNCERTAIN FUTURE OF LARGE SILVICULTURAL PLANTATIONS IN THE AMAZON

While large scale silvicultural plantations are showing signs of potential long range problems at Jari, Brazil is nonetheless racing to establish immense new silvicultural areas elsewhere in the Amazon. Daniel K. Ludwig has sold a controlling interest in his Jari plantations after losing a substantial portion of his vast fortune. Although institutional impasses complicate the history of his decision, the fact that the trees he planted grew at only roughly half the rate originally envisioned underlies the importance of all proximal causes of the recent sale. While the present-day economic balance sheets of Jari are of great concern to all involved, the long term sustainability of such projects, going beyond the discounted returns that command the attention of economists and investors, should be of far more vital interest to the people of the Amazon region. Many precautions needed to increase the chances of long term sustainability of silviculture at Jari have not been contemplated, or have been abandoned in recent efforts to stem short term losses. The company's research effort, essential to insure that solutions will be available when future problems arise, has been all but abandoned. Consideration of the eventual necessity of supplying the nutrients removed in harvested biomass has never entered economic calculations. These and other precautions will be necessary if production is to be sustained on a long term basis at Jari (see *The New Jari: Risks and Prospects of a Major Amazonian Development*, *Interciencia*, this issue).

Implanting silvicultural plantations on the scale of Jari would be risky and difficult in other areas of the Amazon (see *Jari and Development in the Brazilian Amazon*, *Interciencia*, 5(3): 146-153). Nevertheless, a silvicultural plantation scheme which dwarfs that of Jari in virtually every respect is being implanted as a part of Projeto Grande Carajás: the mining, agricultural, and industrial development plan which will completely transform the southeastern portion of the Brazilian Amazon within the next five years. The Carajás Project as a whole, encompassing approximately 80 million hectares (about one-sixth of Brazil's Legal Amazon), envisions an investment of US\$33 billion, as compared with Ludwig's investment on the order of US\$ 1 billion at Jari. The silvicultural plantations at Carajás are planned to cover 2.4 million hectares, or twenty-four times the area of Jari's plantations. The Carajás plantations are part of a master plan for exploiting what many believe to be the world's largest concentration of minerals, including 18 billion metric tons of iron ore (66% Fe₂O₃), 45 million metric tons of manganese ore, 3.5 billion metric tons of bauxite, 45 million metric tons of nickel (1.5% Ni), 550-660 million metric tons of copper ore (0.9% Cu), and "significant" deposits of tin and gold, all located within a few square

kilometers at Serra dos Carajás. A 900 km railway is under construction to transport iron and other ores to the port of São Luis, in the State of Maranhão while the Araguaia River is being dredged to improve navigation to the Amazon River and the State of Pará's future industrial pole and deep water port at Barcarena, near Belém. Amazonia's largest hydroelectric project, the 3890 megawatt dam nearing completion at Tucuruí on the Tocantins River, will supply power to the various parts of the Carajás scheme. The silvicultural plantations, divided into 10,000 ha properties along the railway route, will supply charcoal for converting a small portion of the iron into steel.

The vast *Eucalyptus* plantations planned for the Carajás area run a high risk of eventual problems with diseases and insect pests. Growing insect problems in other *Eucalyptus* plantation areas in Brazil, especially in the 1.4 million hectares planted in the State of Minas Gerais between 1973 and 1980, should give reason for pause. The more recent *Eucalyptus* plantations at Jari should also be carefully watched. The lessons learned in these places are likely to be those which have been learned by others in the long history of efforts to maintain large scale monocultures in the tropics. Silviculture of this type is both uncertain and difficult, as Jari's managers have discovered. While few bankers and investors are anxious to come to the aid of the ailing Jari project, governments and corporations are practically falling over each other as they vie to contribute to any part of the Carajás scheme. The unimaginable wealth of the mineral deposits is seen as insuring the security of any money invested. In the haste to develop these resources, care must be taken that the forms of associated agricultural and silvicultural development employed are sustainable over the long term. Such agronomic sustainability is only one part of an interdependent complex of factors which must be addressed if the future wellbeing of the human population in these areas is to be assured (see *Development Alternatives in the Brazilian Amazon: an Ecological Evaluation*, *Interciencia*, in press). Sustainable developments must be promoted, and the social and other mechanisms installed, that will secure the welfare of future generations both at Jari and Carajás, and throughout the Amazon.

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