

Some Inputs from the Forestry Institute to Floram Project

Forestry Institute



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INTRODUCTION

As the oldest forestry agency in the state and possibly in Brazil, the Forestry Institute feels compelled to address the Institute for Advanced Studies of the University of Sao Paulo, where Floram Project is currently being developed. We were asked to provide our contribution by the director of that organization, Dr. Jacques Marcovitch, during the workshop held June 21 at the Secretariat for the Environment, in response to the remarks made by one of our researchers.

We commend the discussions expressing the concerns of the Institute for Advanced Studies and wish it success in its endeavor to recruit the support of all segments of Brazilian society. We hope that bureaucratic and economic constraints will be overcome both in the country and abroad for this ideal to become reality.

The Institute is to be praised for its initiative of addressing an issue of such magnitude not only from a national angle but also from a global approach in pursuit of an ideal embraced by our institution for the state of Sao Paulo for over one century, as evidenced in Annexes 1 and 2. In the same spirit and to stimulate reforestation in the State of Sao Paulo, the Forestry Institute forwarded to the Brazilian Forestry Development Institute — IBDF in 1981 a paper entitled "Measures to Promote Reforestation and Conservation of Forestry Resources in Sao Paulo" (Annex 3).

In 1984, it submitted to the state government a "Proposed Forestry Policy for the State of Sao Paulo — Emergency Plan" (Annex 4). Within regional and budgetary constraints, this was another attempt to approach the objective now pursued by Floram Project.

As indicated by our representative at the aforesaid workshop, this Institute is concerned with the way the process is being conducted at state level. This concern extends to the national level, and we would like to share them with the study group as a

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** The Forestry Institute is an institution of the Center for Natural Resources Research of the Secretariat of Environment of the State of São Paulo.

contribution by our Institute based on the challenges it has met throughout the years in managing forestry affairs.

GENERAL REMARKS

There are a few unanswered questions about the scope of Floram Project on a national level:

- How was the target set at 20 million hectares?
- Was the focus chiefly on current industrial demand?
- What about future demand?

— Does the budget earmarked for environmental reforestation also include funds for effective implementation of the federal, state, and local Conservation Units already created?

— Will there be funding for judicious demarcation of land, expropriations, human and material resources for surveillance and management of such areas?

- What sort of surveillance system is planned to monitor the actions proposed?

Our concern, however, focuses on two basic issues that might be negative from the standpoint of social development:

1. ENVIRONMENTAL IMPACTS RESULTING FROM REFORESTATION

The rationale so far disclosed by Floram Project does not hint at the monitoring mechanisms foreseen. A project of this magnitude, with a global scope looking at the environmental issue from the angle of the "greenhouse effect" may incur in the sin of neglecting to adjust to the day-to-day reality.

In fact, the "State Forestry Economic Zoning" (Annex 5), where the gap between the macro and micro approaches was shorter than in Floram Project, there was a distortion in that the entire Sorocaba Administrative Region was included among the "Priority Reforestation Areas." No consideration was given to the fact that this would ultimately attract highly polluting paper mills to that area. The net result was a struggle by the citizens in the '70s against a Braskraft plant being built in the Paranapanema River Valley, the only unpolluted watershed at the time.

On the other hand, studies developed by a researcher of the Forestry Institute for the Ribeirao Preto Administrative Region between 1962 and 1984 (Annex 6) found that

subsidized reforestation developments were more devastating than the Pro-Alcohol program so strongly reproached for environmental reasons.

Because of indiscriminate agricultural expansion, Brazilian forests are fast being destroyed with major losses of top quality genetic material. The biodiversity of forest species is a natural defense mechanism against plagues, diseases, and adverse conditions. Natural selection acting upon this genetic diversity breeds evolution. The lack of biodiversity is a point against clonal breeding in forestry. Those who move in that direction risk losing everything, unless some care is exercised, such mixing different clones.

Clone planting is a practical approach currently employed by a number of Brazilian companies. Genetic breeding everywhere in the world makes the most use of biodiversity by planting parent populations and selecting individuals with the desired phenotypes, vegetative propagation, and installing clonal orchards with first and subsequent generations.

2. LAND OWNERSHIP AND ECONOMIC CONSEQUENCES

Although Floram Project covers reforestation of small and medium properties, as emphasized by Dr. Werner Zulauf during the workshop, we would like to recall that subsidized reforestation developments of the early sixties had the same focus and even provided the necessary legal instruments. Such instruments, however, were not sufficient to overcome the capital holders' lobby.

To dispel the idea that its was typical of the "dictatorship" days, the chart below (Chart 1) gives a comparison of paper pulp export prices to the prices paid by industry to growers for timber during the same period and even after the New Republic.

At the time there was no attempt to create the necessary structure to enforce actions provided for in the legislation. Quite the contrary, the structure in place for the Sao Paulo state forests was dismantled.

Between 1980 and 1983, the Forestry Institute promoted the state "Reforestation Program for Small and Medium Rural Properties" — REPENIR. Now no longer an extension agency, our Institute found in that experiment (Annex 7) a positive response of farmers to the program. Interestingly, there was greater demand for species not considered under pulp and paper production programs. Investors rather chose species used for more sophisticated purposes, such as *Eucalyptus citriodora*, instead of faster growing but poorer quality timber species.

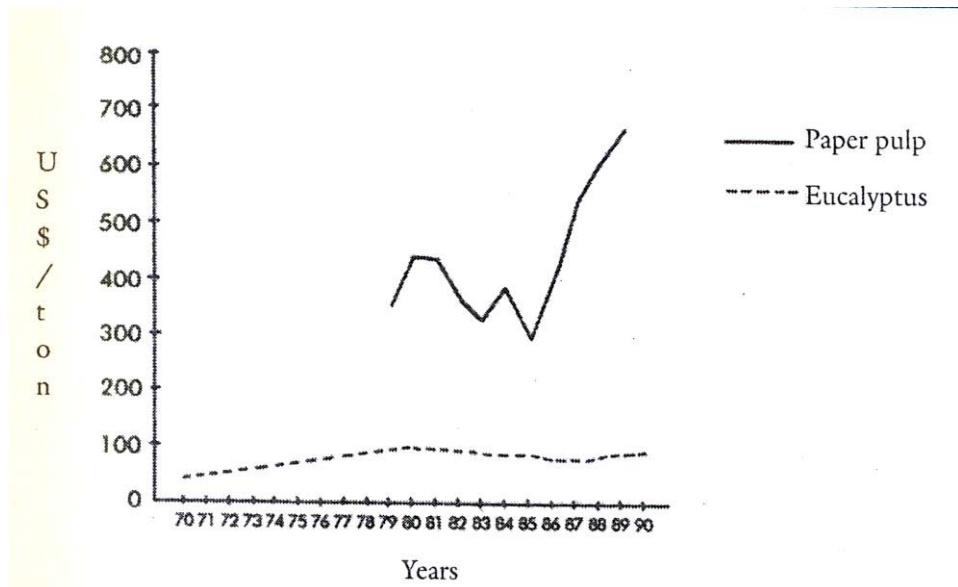


Chart 1 — Paper pulp prices (FOB) and timber prices (CIF in US\$/m³ st. debarked) to produce 1 t of paper pulp.

Chart 2 shows how Brazil ranked in comparison to other countries in the cost of short and long fiber pulpwood.

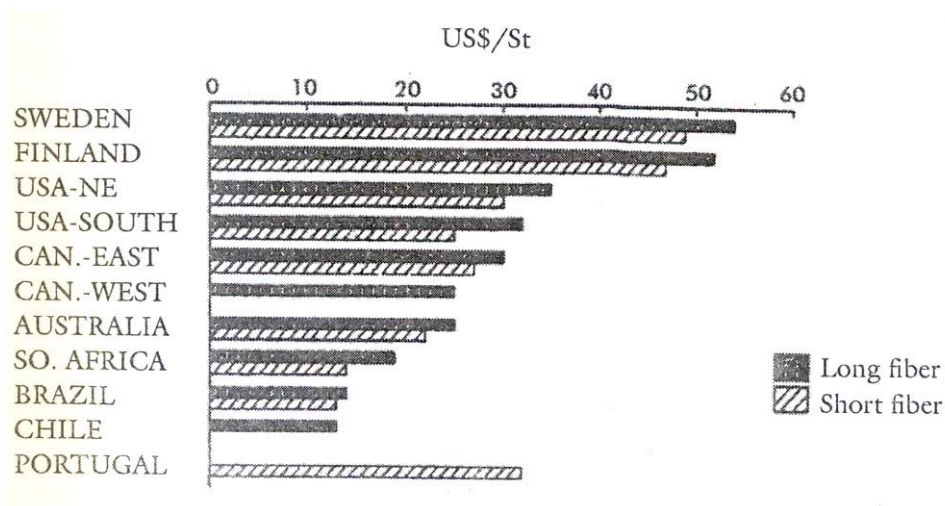


Chart 2 — Brazilian rank in the international cost of pinus and eucalyptus (Prices for the 4th quarter of 1986 in US\$/ m³ st. debarked).

It was also clear that programs of this nature can only work if good quality seedlings are available at planting time as well as technical assistance before and after planting, indicating the need for a proper support and forestry extension structure.

One of the merits of reforestation in small and medium rural properties is the spread of small forest stands. They both minimize disease and plague propagation and supply local timber markets.

A word of caution seems to be needed regarding the strategies proposed for industrial plantations, i.e. reforestation with high-yield clones: the risk of forest diseases and plagues may reach alarming proportions due to the loss of genetic variety, to vertical or horizontal resistance, not to mention other aggravating factors affecting wildlife biodiversity as secondary woods are cleared. They serve as shelters for a number of native populations which control both plagues and diseases.

CONTRIBUTIONS TO FURTHER DEVELOPMENT OF FLORAM PROJECT

Annex 8 contains a schedule of activities and research under way at our institution.

Among the studies and actions already developed and in progress at the Forestry Institute, the following may be important contributions for Floram Project as it develops:

a) The "Macro zoning of Land Around the Ribeira de Iguape River, SP" (Annex 9) addresses forestry from a broader perspective, given the other local activities, and indicates how the Forestry Institute might assist Floram Project when its studies are brought to the local level. The study was proposed by this Institute in 1977, and despite all political constraints and red tape, its philosophy was partly recovered when it was finally initiated in 1988.

b) In regard to soil use and occupation, critical areas now deteriorating because of anthropic action have been studied by the Forestry Institute considering their physical, climatic, and biological aspects in addition to anthropic factors. The idea is to propose alternative prevention and corrective measures (Annex 10).

c) Forest hydrology studies currently being developed by the Cunha Center at the Serra do Mar State Park and Mogi Guacu Experimental Station (Annex 11) hope to provide inputs for watershed management and monitoring for qualitative and quantitative water supply. The transfer of experimental findings to other localities will have a multiplier effect, thus increasing the possibility of reclaiming and preserving other water sources.

d) The Institute also has a staff of researchers working on issues such as reclamation and management for natural regeneration of native forests. The report "Heterogeneous Reforestation with Indigenous Species" (Annex 11) is a good illustration of this type of action in a degraded area of Cosmópolis, SP. "Natural Regeneration of

Riverside Woods at the Bauru Ecological Station" (in the presses now) is a second example.

e) On production forests, the Forestry Institute is developing genetic breeding studies with selected species of coniferous and broad-leaved species, both exotic and native, to improve forest yield per unit of area. These studies so far involve genetic preservation of such species, installation of parent populations, matrix selection, installation of 66 different parents and progenies, formation and management of orchards, production of improved seeds, and technology exchange with private companies and research institutions. Annex 13 provides a listing of species and parents on which the Forestry Institute has been working toward production forests.

Nine species and varieties of *Pinus* are being worked on and first generation clones are already in production, with about 10% genetic improvement. Seven species of *Eucalyptus* are being researched for production of sawnwood and fuelwood. Both species under study already have parent populations in place, some already undergoing phenotype selection.

The "Genetic Improvement" program developed by the Forestry Institute consists of the following sub-programs:

1) Tropical *Pinus* — priority species and varieties are *Pinus caribaea* var. *hondurensis*, *P. caribaea* var. *caribaea*, *P. caribaea* var. *bahamensis*, *P. oocarpa*, *P. kesiya*, and *P. patula tecunumanii*.

2) Subtropical *Pinus* — priority species and varieties are *Pinus elliottii* var. *elliottii*, *P. taeda*, and *P. maximinoi*.

3) *Eucalyptus* spp. — priority species and varieties are *Eucalyptus citriodora*, *E. tereticornis*, *E. camaldulensis*, *E. urophylla*, *E. cloeziana*, *E. resinifera*, and *E. pilularis*.

4) Native Species — priority species for genetic conservation through parent populations are the Brazilian pine (*Araucaria angustifolia*), copaiba oil (*Copaifera langsdorfii*), guaritá (*Astronium graveolens*), timburi (*Enterolobium contortisiliquum*), wild peach (*Prunus myrtifolia*), cambaru (*Dipteryx alata*), peanut (*Pterogyne nitens*), aroeira (*Astronium urundeuva*), Sao Paulo jacaranda (*Machaerium villosum*), guarucaia (*Peltophorum dubium*), jequitibá-rosa (*Cariniana legalis*), pau-d'alho (*Gallesia gorazema*), cabreúva (*Miroxylon perniferum*), pau-marfim (*Balfourodendron riedelianum*), ipê-roxo (*Tabebuia avellanadae*), jatobé (*Hymenaea stilbocarpa*), louro-pardo (*Cordia trichotoma*), and ipê-amarelo (*Tabebuia vellosi*).

5) Vegetative Propagation — priority studies on *Pinus patula tecunumanii*, *P. elliottii* var. *elliottii*, *P. taeda* and tropical *Pinus*.

6) Resin Species — priority studies on *Pinus caribaea* var. *hondurensis*, *P. Caribaea* var. *bahamensis*, and *P. elliottii* var. *elliottii*.

f) With regard to seed research and production at the Forestry Institute, both native and exotic species are being examined. Chart 3 gives an idea of seed production from 1980 to 1989. *Pinus* and *Eucalyptus* already show genetic gains thanks to improvement work.

The biodiversity of forest species is a natural defense mechanism against plagues, diseases, and adverse conditions.

Annex 14 lists the variety of species produced by the Institute.

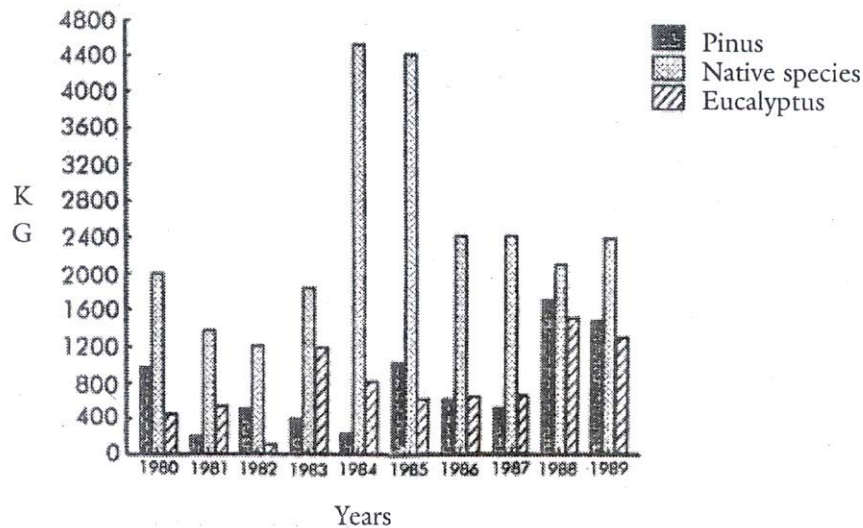


Chart 3 — Production of eucalyptus, pinus, and native species seeds
(Source: Forestry Section, Dasonomy Division, Forestry Institute — SP).

- g) The "Forestry Inventory" is near completion. Its goals are:
- to determine spatial distribution and quantification per area of natural plant cover and reforestation in the state;
 - to chart and quantify natural plant cover according to phytophysognomic types (wood, brushwood on cleared land, tropical forest savanna or *cerradão*, *cerrado*, tropical savanna with small trees or *campo cerrado*, alluvial plain swamps or *várzeas*, coastal barrier, etc.);
 - to chart and quantify reforestation in terms of area and volume of timber available;
 - to chart areas to be maintained under permanently preserved characteristics.

h) The "Ecological Forest Zoning" also under way at the Forestry Institute proposes:

- to establish ecological-forest units of homogeneous features such as climate, soil, and topography;
- to suggest for each ecological unit the forest species and parents suitable for rehabilitation programs in depleted forest areas;
- to determine supply sources for seeds, exotic and native species of known quality for the above programs;
- to suggest to small and medium farmers the forest species best suited to supply the most needed raw materials, in addition to pulp and paper production.

i) On the serious matter of slash-and-burn practices and forest fires, the main focus of international attention to Brazil and the Amazon in particular, the state of Sao Paulo now has a program called "Mata Fogo" (literally 'Kill Fires'). In addition to the Forestry Institute, it involves all civil defense departments in the state plus the State Military Advisors, CPRN, CETESB, Departamento de Proteção de Recursos Naturais (DEPRN), the Forestry and Water Source Police, the Dire Department, local governments, and forest industry companies.

This program originated at the Forestry Institute. In 1984, an effort began to organize the communities around Itapeva and Itararé, especially local reforestation workers and policy-makers. The Capão Bonito Florestas Nacionais (FLONA) also provided invaluable support.

By 1986, this initiative had become a joint undertaking with the Instituto Brasileiro de Desenvolvimento Florestal (IBDF) Regional Office, the Forest and Water Source Police, DEPRN, Conselho Estadual do Meio Ambiente (CONSEMA), and the Reforesters' Association, among others, to extend the same organization to the entire state. Currently this joint effort has the vital physical support of the network of Experimental Forests and Stations, State Parks, Ecological Stations, and Forest Nurseries reporting directly to the Forestry Institute. Annex 15 explains these actions through a record of fires attended to in June 1990. Chart 4 illustrates the respective percentages.

The purpose of this report was to indicate the potential offered by our institution in terms of contributing toward the development of Floram Project. We are more than willing to assist in any matter relating to it.

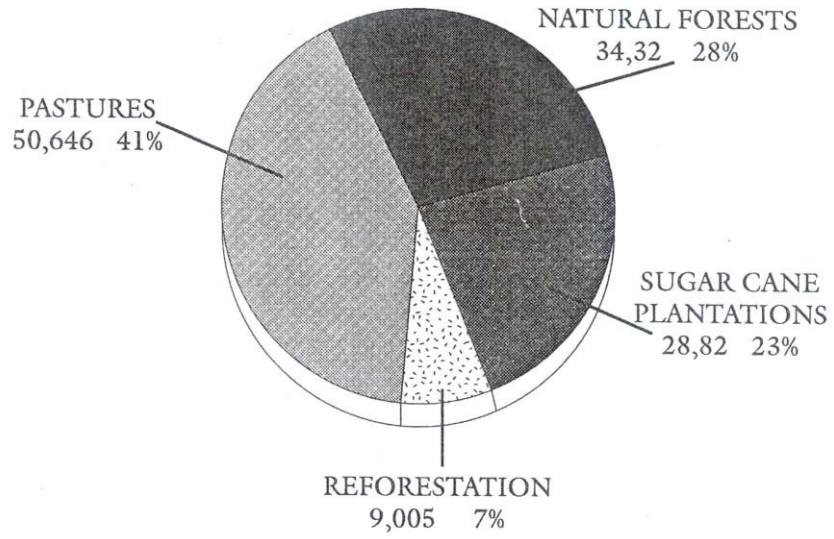


Chart 4 — Number of fires according to percentage of vegetation cover affected. Period: June/1990.