

# Comments about Floram

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Oswaldo Sevá\*\*

1. I attended three meetings of the group in charge of developing the program (July 18, September 20, and October 11) as an observer and visiting professor at IEA in the field of Environmental Sciences.

The research project discussed here focuses on the issues of Technologic Risk and Changes in Natural Dynamics as a result of some key industrial and energy-generating processes. From this standpoint, one of the main changes involved is increase of CO<sub>2</sub> levels resulting from the burning of fossil fuels, firewood, and charcoal as well as from plant cover clearing for industrial and energy generation purposes. The research study plans to further detail such mechanisms and the combined effect of this and other significant changes on a local-regional as well as global scale.

2. A reading of preliminary papers provided to the group by Dr. Zulauf and Dr. Rodés, and of the study reported by F. Ramade in "Ecologie des Ressources Naturelles" (MASSON, Paris 1981) suggests the following conclusions:

— half or more of the total CO<sub>2</sub> emissions are taken up by the oceans to restore equilibrium to the biogeochemical cycle. The actual role of biomass is still subject to controversy, particularly in assessing materials balances involving annual tonnages of roughly 10<sup>9</sup> or 10<sup>10</sup>;

— reversal of the upward trend in concentration levels and a possible subsequent reduction will depend on three classes of practical actions performed simultaneously:

I — reduction and interruption of forest clearing

II — replenishment of plant and especially forest cover

III — reduction of the increase in emissions from fossil fuel burning, their stabilization and subsequent reduction.

3. A program to replenish forest cover in Brazil could have positive effects over the medium run, considering that the country accounts for approximately 1/10 to 1/6 of total

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world emissions. However, it would fail if the following current constraints and circumstances go unchecked:

— the use of charcoal and firewood by nonferrous metal smelters, ferroalloy plants, pig iron makers and steel mills, cement, lime and pottery industries, some agribusinesses ... has grown 2.5 times during the past decade. It is now around 35 to 40 million cubic meters (for the roughly 70 Associação Brasileira de Carvão Vegetal-ABRACAVE member companies alone), of which only 6 to 7 million are supplied by reforestation developments;

— the coexistence of native and remaining secondary woods and forests plus future planted forests side by side with areas downstream from wind and atmospheric flows polluted by fossil fuel emissions may lead to inconsistencies such as "maintaining or creating woods just to be sacrificed by acid air pollution."

The main emphasis here is on areas of extra traffic densities, areas of heavy industrial boiler stack concentration, oil— and coal-burning power plants, petrochemical and carbochemical plant complexes, and oil refineries. Judging by the tonnage of SO<sub>2</sub> fumes alone, we already have some areas classified as critical by European standards — over 50 thousand tons a year of sulfur dioxide per 100 x 100 km square.

Depending on industrial smokestack height, on fuel sulfur content, as well as on local and regional relief and meteorological conditions, the area affected by acid rain and the formation of photo-oxidants (e.g. low altitude ones like peroxyacetylnitrate) may extend 50, 100, 200 or more kilometers from the emission source. Rain and other moisture deposits may have their pH lowered from historical levels (6.5 to 5.5) to 4 or less. Forest death is already evident in Scandinavia, Central Europe, and Canada after a few decades of continuous SO<sub>x</sub>, NO<sub>x</sub>, and other pollutant emissions.

4. Some other virtues of such a program are as important as its possible contribution to reducing the greenhouse effect. Perhaps they should undergo as much detailing both in terms of approach and of areas selected as targets for the early stages of the program. These are a few suggestions:

— riparian and headwater woods;

— protection belts around artificial dam lakes and weirs (Brazil has roughly 40 thousand square kilometers of such waterways and a half-kilometer band replanted around each of those "lakes" would total approximately 40 thousand hectares);

— critical erosion zones (e.g. denuded hilltops, badlands, quasi-desert areas, land devastated or rendered sterile by mining and gold panning).

In all three cases, the goal would be to rehabilitate the hydrological cycle by slowing down silting and, if at all possible, reversing the current rate of "lake" obstruction. Highly beneficial and immediate relief can be expected from this: lower geotechnical risk for darns, lower storage and power generation losses, and particularly improved chances of controlling and buffering against the overflowing of our major rivers or of rivers cutting through urban centers.

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A further listing of areas that might be selected for replanting includes:

- woods in undulated low lands (e.g. along the Northeastern coast);
- sites bearing orchards and native or commercial fruit groves, many of which have been destroyed by expanding single-crop practices and housing developments;
- mangroves, marshes and thickets.

5. The social and political issues involved in a program of this nature are numerous and complex. They must be addressed and discussed. A possible strategy is the gradual opening of woods, for example, in the form of extraction reserves (as initially proposed for rubber tree stands but also viable for *babaçu* palm and palmetto groves), or as community woods combining nurseries, tilled crops and harvesting like the so-called *faxinais* of Paraná and Santa Catarina. Another possible strategy is to give priority to replanting with varied species, either restricting or forbidding further industrial exploitation, incorporating replanted areas to ecological or biological reserves or — in selected cases — to recreational areas.