Floram Project:
Strategies and Action Plan

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In order to set overall strategic guidelines for the several activities foreseen under Floram Project's action plans, criteria on the following issues have been developed and discussed:

- Reversal of the greenhouse effect.
- Conservation of local ecosystems.
- Reforestation and soil use.
- Reforestation and industrial development.
- Fuel wood.
- Institutions, business, cooperatives.

The methodology adopted and the above items were selected according to the FAO report *Tropical Forestry Action Plan.* The strategic criteria recommended, therefore, are an adaptation of the FAO counterparts with a focus on the unique features and peculiarities of the Brazilian forests.

* This text has been extracted from the special issue of *Estudos Avançados* on Floram Project, published in English in 1995. The original version, in Portuguese, was published in no. 9, May-Aug. 1990.

1. Strategies and Action Plans

1.1. Reforestation to Reverse the Greenhouse Effect

STRATEGIES	ACTION PLANS
To determine Brazil's contribution to reabsorbing excess CO2 in the atmosphere.	Within the next 30 years, to trap at least 5% of the carbon built up in the world atmosphere into phytomass and thus help reduce the Greenhouse Effect.
To develop procedures for megareforestation efforts throughout Brazil broken down into subsections of varying priority.	To develop a Reforestation Program involving at least 20 million hectares consistent with related physical, environmental, and social impacts.
To lay the groundwork and strategies for a definitive solution through replacement of fossil fuels.	To raise the awareness of the Brazilian and international communities about the pressing need to operationalize the use of clean energy in gradual replacement of fossil fuels.
To create domestic and external funding facilities to provide a solution to global environmental effects.	To contribute toward a World Clean Energy Fund designed to finance programs to reverse the Greenhouse Effect.

1.2. Conservation of Local Ecosystems

STRATEGIES	ACTION PLANS
To set aside special sites to shelter and protect wildlife, ecosystems, and genetic heritage.	To develop a grid of environmentally protected areas nationwide with international connections.
To improve and expand the management of available natural resources toward sustained production.	To improve management of protected environmental areas.
To monitor conservation areas through suitable remote sensing techniques to ensure data transparency.	To strengthen managerial skills and personnel training for reforestation and monitoring.
To secure the support of local communities.	To preserve the genetic heritage in terms of biological diversity and germplasm banks.

1.3. Reforestation and Soil Use

STRATEGIES	ACTION PLANS
To combine forestry actions at preselected sites with local agriculture and livestock raising thereby improving yields.	To encourage agricultural, forestry, and livestock development.
To plant forests in depleted soils toward development of agribusinesses and soil reclamation.	To introduce social forestry practices together with economic and environmental forests.
To include reforestation in the organization of rural AREAS aiming at diversification of economic activities.	To foster integrated management of water resources.
To expand the contribution of forestry toward environmental conservation and control of desertification and/or soil scouring.	To step up reforestation in open field formations, devastated areas, and areas of eroded and scoured soils.
	To assess occupancy rates at areas targeted for reforestation for consistency between preservation of natural ecosystems and agroecosystems.

1.4. Reforestation and industrial development

STRATEGIES	ACTION PLANS
To generate enough jobs and offer wages conducive to self-sustained production in optimum environmental preservation conditions.	To intensify forestry development and management.
To stimulate demand for durable industrialized *or* semi-industrialized forest products.	To develop efficient planting and harvesting systems.
To expand and diversify exports of processed forestry products minimizing pressures on native forests.	To make the Program compatible with a small- and medium-property size land ownership model, avoiding ownership concentration.
To engage rural populations in the planting, harvesting, and processing of forestry products.	To develop the marketing capacity of the forest products' sector.
	To foster and disseminate proper drying and processing of wood to supply the construction industry.

1.5. Fuel Wood (firewood from planted forests)	
STRATEGIES	**ACTION PLANS**
To rationalize firewood consumption in rural areas.	To raise firewood burning efficiency.
To decrease firewood use in urban areas.	To produce more firewood and charcoal at sites currently preserved for this purpose (particularly in small rural properties).
To encourage the consumption of charcoal - from planted forests – as an alternative to fossil coal for industrial purposes, especially in steel mills.	To regulate the use of firewood according to the different local ecological alternatives available in the country.
1.6. Institutions, Business, Cooperatives	
STRATEGIES	**ACTION PLANS**
To institutionalize Floram Project and its management through a private foundation involving liaison arrangements with several federal, state, and local institutions.	To secure domestic and international political endorsement for implementation of Floram Project.
To combine reforestation and Brazilian national development.	To motivate all segments of the Brazilian community toward the environmental, economic, and social goals of Floram Project.
To outline a cooperative remote sensing system to monitor reliable reforestation projects and to operationalize it under full transparency.	To develop a Brazilian data network on remote sensing monitoring and to integrate it to a world network.
To notify agencies, businesses, and cooperatives involved in forestry activities.	To build up documentation and training for design and performance of basic research.
To plan for sustained channeling of social and economic benefits to municipalities.	To stimulate forestry/agriculture/cattle raising extension focusing on basic research and on planned regional development.
To improve forestry worker training, research and extension education systems, and respective institutions.	To enlarge and strengthen the skills of extension workers as bridges between basic research and innovation development.
	To channel information and provide all available assistance to local regional organizations.

2. STRATEGIES ESPECIALLY TARGETED TO DOMAINS AND REGIONAL SITES

The overall criteria defined in line with the above approach translate into several sets of differentiated strategic recommendations. Each is targeted to one or more of the sites under consideration.

The targeted sets of strategic recommendations are:

1. Ecological domains, regional AREAS, and occupancy rates: environmental impact assessments.
2. Strategies for reforestation in the mixed prairies of Rio Grande do Sul *(Coxilhas).*
3. Strategies for reforestation of the Paraná pine domain.
4. Strategies for reforestation of the *cerrado* domain.
5. Strategies for targeted reforestation in Tropical Atlantic Brazil (Sea of Hills).
6. Strategies for reforestation of the dry Northeastern hinterlands.
7. Strategies for reforestation of critical Amazon areas.
8. Strategies for preservation and managed exploitation at forested refuges: Northeastern marshes and coppices in Central Brazil.
9. Strategies for replanting of trees in urban and suburban areas.
10. Strategies and guidelines for protection of reservoir banks and surrounding perimeter.

2.1. Ecological domains, regional AREAS, and occupancy rates: environmental impact assessments	
STRATEGIES	**AREAS**
To consider the potential share of each domain for reforestation purposes, taking into account its natural organization as well a spontaneously developed human organization and encroachment.	To select and monitor the development of secondary forests.
To have a sound conceptual basis and enough flexibility to properly schedule species introduction and reintroduction activities.	To spare as many areas as possible for reforestation at sites provably suitable for agriculture.
To identify for each domain all cost/benefit impacts foreseeably caused by the Program and its possible encroachment on environmental dynamics, diversification of agricultural, livestock, and industrial activities.	To recommend distinct and specific occupancy rates for each local site in the different domains. To check on actual or potentially critical erosion and silting problems that might be corrected by reforestation.
To meet pressing reclamation requirements by reintroducing native species in critically devastated areas (seas of forested hills, savanna-like areas, and overgrazed areas).	To multiply vegetable gardens and seedbeds throughout all Brazilian environmental domains for scheduled introduction or reintroduction of species. To reintroduce tree species at devastated areas. To reintroduce stands of assai euterpe palms *(Euterpe oleracea)* at riverside woods alongside creeks, streams or major Amazonian rivers. To ensure continuous monitoring of industrial relocation areas that might interfere with reforestation developments.
2.2. Strategies for reforestation in the mixed prairies of Rio Grande do Sul *(Coxilhas).*	
STRATEGIES	**AREAS**
To rehabilitate areas of soil scouring in the Southeastern tip of Rio Grande do Sul through managed forestry (sectors known as sand flats or *deserts* in the Alegrete region).	I SE tip of Rio Grande do Sul and SW *Campanha.*
To introduce forestry management expansion to infertile soil tracts or substeppe areas along the S-SE Rio Grande do Sul border.	II SE tip of Rio Grande do Sul, SE Mountains & *Coxilhas.*
To propose intraparcel reforestation rates for barren soils located west and N-NW of Santa Maria without encroaching on local farming and cattle raising activities.	III. São Francisco de Assis Prairies, Rio Grande do Sul Prairies and West of Santa Catarina.
To turn all remaining Parana pine stands south of the central depression of Rio Grande do Sul into contained preservation units.	W. NW Prairies of Rio Grande do Sul, infertile land in NW Rio Grande do Sul.
2.3. Strategies for Reforestation of the Parana Pine Domain	
STRATEGIES	**AREAS**
To pragmatically review the issue of replenishing Parana pine stands at different sections of the Brazilian Southern Plateau with the suitable leading edge forestry biotechnology.	V Vacaria Prairies - Midlands Plateau & Campos de Vacaria.
To encourage rural land owners in strongly expanding agricultural areas to utilize subtropical vegetation (including Parana pines) inside and around their parcels for multiple purposes.	VI Lajes, São Joaquim high plateau & Lajes Meadows.
To recommend expansion of a silviculture model - provably successful - combining pinus, Parana pine, eucalyptus, acacia, and mimosa in a well-spaced mosaic pattern.	VII Purunã - Castro, Jaguariaíva, second plateau of Parana – Altos Campos de Purunã.
To spare and replenish mountainous forests at the rim of Araucárias Plateau (e.g. Serra Geral or crest escarpments).	VIII Old Northern Parana bridged with Castro, Jaguariaíva, and Middle-Upper Paranapanema.
2.4. Strategies for Reforestation of the Cerrado Domain	
STRATEGIES	**AREAS**
To define sufficiently wide spaces for production forestry at interior cerrados in naturally poor soils.	IX Second Plateau Depression, São Paulo. X Eastern Mato Grosso do Sul, Upper Parana Plateau in Mato Grosso do Sul.

To protect woods and galleries from silviculture encroachment, assuming the preservation of interarea belts for headwaters of rivers feeding the Mato Grosso Pantanal.	XI Gallery Forests of Western Mato Grosso do Sul *Cerrados,* Waterfalls of Rivers feeding the Greater Mato Grosso Pantanal.
To tap previous reforestation expertise built up locally to strengthen and consolidate new developments.	XII Subcoastal sections of NE Rio Grande do Sul and Eastern Santa Catarina, Subtropical Atlantic Coast of Santa Catarina, Upper Itajaí Valley in NE Rio Grande.
To systematically avoid extensive homogeneous plantations. To achieve this, mosaic-like planting and differential cloning are required.	XIII SO-SE Minas Gerais, Southern Headwaters of the Sao Francisco, area located between the Upper Rio Grande, Canastra Range and Quadrilátero Ferrífero.
At highly compartmented zones (e.g. Triângulo Mineiro, Southern Goias and Canastra), to preserve cerrados and lime-covered cerrados as well as vegetation on steep slopes.	XVIII Western Plateau of Bahia & Northwest Minas Gerais (up to Piauí border), Western Bahia & Northwest Minas Gerais *Cerrados.*
To make every effort to replenish forests, galleries of highland rivers (Mato Grosso do Sul) feeding the Pantanal.	XIX North-South Railroad Tracks in the State of Tocantins (formerly Great North of Goiás). XXI NE Bahia, North & NE of the Lowlands, Expansion of planted forests. XXIV Sub-Areas For Future Development at The *Cerrado* Domains Group 1. Montes Claros Area & Surroundings Group 2. Area located N-NE of Brasilia Group 3. Extreme SE of Goiás (discontinuous spaces throughout the *Cerrado* Domain)

2.5. Strategies for targeted reforestation in Tropical Atlantic Brazil (Sea of Hills)

STRATEGIES	**AREAS**
To develop areas of differentiated reforestation along river banks in eastern NE, from E of Rio Grande do Norte to the Bahia Lowlands (formerly known as *Zona da Mata).*	XV SE Brazil Mountains and Slopes; SE Ranges Domain.
To develop a special mixed reforestation plan for the entire Doce River Basin according to local peculiarities. To reclaim the rim of the Bahian plateau with broad introduction of native species.	XVI Upper & Middle Doce Valley; Mountains, Polyconvex Mountains of the Middle & Upper Doce, and Jequitinhonha Plateau.
To reclaim the wide belt of Southeastern sierras from Espirito Santo to the Paraiba do Sul Valley in São Paulo and Minas Gerais with predominantly ecological reforestation according to carefully designed strategies. Same for devastated areas at Mantiqueira, Bocaina, and Mar ranges.	XVII Cool Woods - Liana Woods Transition Zone in Southern Bahia Plateau.
To study expansion of silviculture in sections of the Southern Bahia Plateau located between the *cool woods* and interior brush lands (N of Vitória da Conquista).	XXIII Tropical Central Atlantic Brazil. Subcoastal Zone extending from Northern Rio de Janeiro to the Lower Jequitinhonha in Bahia, where silviculture has been developed for years by several pulp & paper companies.
To expand mixed reforestation to N and NW of the Bahia Lowlands in areas of suitable climate and environment transition.	

2.6. Strategies for reforestation of the dry Northeastern hinterlands

STRATEGIES	**AREAS**
Intensive and permanent efforts to introduce adapted species - non- deciduous where possible - at hinterland hills (in bushy or barren *caatinga* lands).	XXV NE Backland (semiarid Hinterland): reforestation sites with adaptable species & ecological reforestation of river banks.
To develop new technology for wood planting at reservoir banks including tree-like bushes, palm species and possibly wood species.	To stimulate limited expansion of mesquite stands for animal fodder and soil protection up to 15-20% of the total area between rivers and hinterland slopes, similarly to the successful development achieved at Cariris Velhos (in Some).
Special campaign to reintroduce native species at high embankments of rivers, creeks and particularly riverside levees in the dry hinterlands (intermittent seasonal rivers).	
Adequate cashew tree stands along climatic transition zones like the arid hinterland, cerrados and low plateaus.	
Long fiber cotton tree stands (Seri& type) at suitable sites.	
Intensive and permanent effort to generate technologies for industrial use of xerophillic trees as well as oil, wax, rubber, resin producing trees, among others.	

To replant the banks of 70 thousand small reservoirs with fodder-producing xerophillic legume trees and/or fruit trees, to prevent evaporation.	
2.7. Strategies for reforestation of critical areas in the Amazon	
STRATEGIES	**AREAS**
To tap valuable sources of information of developments such as project Jari. Same for the Santarém Plateau and parcels such as Belterra and Fordlândia.	XIV SO-SE Rim of the Amazon, SO-SE tip of the Amazon Lowlands – Northern Mato Grosso/Rondônia.
To develop forestry actions along the wastelands of the Carajás-São Luis Corridor, especially the Maranhão Plateau avoiding impacts on other activities (farming and ranching).	XX Maranhão Plateau section of the Carajás-São Luis Corridor.
To perform experiments for silviculture expansion in Amapá meadows (mainly at foothills), sparing ranges and grazing land and reintroducing tree species along headwaters and levees adjacent to local rivers.	XXII Amapá Meadows & Slopes, Rolling *Cerrado* Savannas in Southeast Amapá.
To reclaim sites originally under forest cover via a suitable agricultural/ cattle breeding combination on a case-by-case basis, particularly along the southern Amazon rim.	
2.8. Strategies for preservation and managed exploitation at forested refuges: Northeastern marshes and coppices in Central Brazil	
STRATEGIES	**AREAS**
To make every effort to preserve sections of *humid mountain* woods currently under strong encroachment from banana crops. The same for slope, piedmont, and river bank swamps.	XXVII Humid tropical islands inserted in NE Backlands 7 small massifs of tropical forests in Central Brazil
An emergency plan to preserve coppices at SE Goiás and Southern Mato Grosso farms to afford full protection to the remaining biodiversity in terms of germplasm banks.	
To use extension practices to preserve brushland *islands* outside the NE hinterlands (Cabo Frio, Jardim Range, São Francisco Range, in Sorocaba/Votorantim).	
To use extension practices to preserve sections of the Roraima prairies, *cerrado* enclaves in the Amazon, and local meadows and prairies.	
2.9. Strategies for replanting of trees in urban and suburban areas	
STRATEGIES	**AREAS**
To encourage the formation of woods or reforestation belts around large cities and towns to prevent or decrease the risk of a global village.	XXVIII Urban & suburban landscape arborization.
To encourage the planning of urban green areas as a buffer to the urban heat cell effects and to improve environmental conditions.	
To reinstate the planting of trees in streets and parks and the use of trees, especially fruit-bearing species, in suitable parcels or plots.	
To carry out reforestation plans to stem undesirable regional conurbation (e.g. the Middle Paraiba Valley).	
2.10. Strategies and guidelines for protection of reservoir banks and surrounding perimeter	
STRATEGIES	**AREAS**
To make reforestation mandatory at reservoir banks (planned).	XXVIII Reservoir banks — at different ecological, hydrological, and geomorphologic areas of inter- and subtropical Brazil.
To plan for afforestation/reforestation of reservoir banks, chiefly with species native to the site.	
To create ecological buffer zones surrounding reservoirs 100 to 300 meter beyond the water line as required by local topology.	

To reforest and/or preserve systematically headwaters and river and stream watersheds feeding such reservoirs.

To control the spread of downstream or branch reservoir deltas through special reforestation developments of river systems or subsystems upstream.

To monitor silting and/or bank erosion zones through management techniques involving new vegetation cover and control of macrophyte, water lilies, and nymphaeaceous growths.


SOUTH AMERICAN
MORPHOCLIMATIC AND PHYTOGEOGRAPHICAL
DOMAINS
SCALE
AB'SÁBER
– 1 977 –
MARANHÃO
PIAUÍ
BAHIA
PANTANAIS
CHACO
ORIENTAL
PAMPA
OCIDENTAL
Equatorial Amazonian domain
Pacific Equatorial domain
Tropical Atlantic domain
- "polyconvex hill slopes" &
- "forested undulated plateaus"
Cerrados domain
Central Brazilian Plateaus
Roraima-Guiana domain
"Gran Sabana"
Llanos of the Orinoco domain
Equatorial Andes domain
(complex altitude zoning)
Caating domain
semi-arid highland depressions
Caribbean
Guajira subequatorial domain
Central Chaco domain
Pacific Coast desert domain
Pumas domain
high Andean bolsones and steppes
Paraná pine plateau domain
Subtropical and temperate
Andean domain (with Paraná pine)
Coxilhas domain
with mixed prairies
Humid Pampas domain
with extensive prairies
Barren plateau domain
"Monte" cactus-lined domain
with residual pits
"Monte" steppe-like domain
with aroid trees
Patagonia steppe domain
deserts and subdeserts
Sub-Antartic Andes domain
with complex altitude zoning
Humid finisterre domain
Patagonian-Magellanic
Sub-Antartic tundra domain
Intrazonal humid hill landscapes
a) "marshes" of the Arid Notheast
b) humid Tucumán-Bolivian (and Cordoban) sierras
Intrazonal rocky landscapes of the Andean cordillera
rockfall and debris, n/reg. dry valleys
high volcanic peaks
Residual glacial landscapes and sub-Antartic finger lakes
High altitude glacial encave landscapes
(intrazonal)

3. A MULTIDISCIPLINARY APPROACH TO THE COURSES OF ACTION PROPOSED

As it stands now, Floram Project and its goals are likely to develop into a number of essentially multidisciplinary secondary projects. The success and effectiveness of the master plan's ultimate objectives will hinge to a great extent on their proper completion.

The broader avenues open for effective action by Floram Project and relevant comments are discussed below. The list is by no means exhaustive.

— *Strategic Planning.* This will provide a comprehensive overview of Floram Project. Discussion and subsequent merger of several strategic approaches originating in and focusing on local concerns, along with strategic plans designed by the key industries involved will be a crucial factor. Any integration approach must consider compatible strategies for reforestation and industrialization of forest products, on the one hand, and the goals of related planning efforts on the other. Examples are agricultural and livestock breeding and industry considered in its entirety. This compatibility refers mainly to energy issues and other inputs.

— R + D *Coordination and Information Dissemination.* Given the pioneering nature of Floram Project, many areas will have to be surveyed in connection with a technological research and development program. Top priority subjects are:

- geomorphology and geoecology of regional areas
- surface soil, geological, and hydrological conditions
- forestry biotechnology
- plant breeding and growth physiology
- photosynthesis efficiency
- climate fluctuations
- remote sensing
- industrial alternatives for forest products
- supply of seeds/seedlings and their preparation
- biological control
- management and handling

Before assigning executive priorities, R & D requirements will have to be carefully examined in connection both with reforestation and to its essentially local aspects. The methods to assess future risks (environmental and social) caused by apparently harmless human actions also need improvement.

Information generated by R & D will be made available by accessing terminals strategically located and fed by a computer network connected to continuously upgrade data banks.

— *Institutional Alternatives.* Active discussions will be opened around the ideas developed in this paper. The purpose is to identify the pros and cons of giving institutional continuity to activities initiated under the name of Floram Project.

Organizational engineering must identify alternatives to design a light structure essentially to provide guidance and incentive to direct efforts toward proper action, in line with the plans to break down the master project into multidisciplinary components.

IEA/USP is naturally assumed to become a hub for feedback and mutual enrichment of the several disciplines involved. It is expected to play an active role in providing permanent institutional assistance.

The institutional framework must meet all administrative needs arising from coordination and harmonizing of strategic plans, both sectoral and local. They include coordination of priorities detected by R & D; supervision of the operational efficiency of the computer network which will make results and recommendations public; executive monitoring of reforestation developments through remote sensing to provide absolute transparency of data and evaluations generated; last but not least, controlling investments, incentives, operating and overhead expenses included in approved budgets developed as one of its most important administrative tasks.

The project developers are fully aware of the highly bureaucratic and constraining administrative practices prevailing at all levels of the government machine. No quarter will be made to any individual or group intending to lay back and continue to enjoy the perks perpetuated in some official machines corroded by nepotism and corrupt practices.

4. CONSIDERATIONS FOR AN INSTITUTIONAL APPROACH

To the extent that is involves massive reforestation developments, Floram Project must rely on strong institutional support to ensure that its objectives will be achieved. Account must be taken also the operational flexibility required by a project of this magnitude and the need to ensure that its basic assumptions outlined in this paper will indeed permeate all forest planting, conservation, and management actions to be performed throughout Brazil.

As it stood in late 1989 (a year after the idea of using reforestation as a tool to trap atmospheric carbon was first voiced publicly and eight months since it was embraced by the Institute for Advanced Studies), the project is yet in an embryonic stage. Though still a unicellular body, it has all the features and structural peculiarities needed to achieve its ultimate goal — control of the greenhouse effect — within the near term, not just in Brazil but also and necessarily on a world scale.

Against the backdrop of the current debate about state intervention versus privatization, Floram Project too will have to choose its institutional framework. A great deal of flexibility and common is the aim, with the support of multi-task partnerships.

The sheer magnitude of the Project will make it instrumental in reversing the negative image Brazil has abroad in matters related to the environment. Not because of what is rumored or written — forest burning in the Amazon is alleged to be the primary source of the greenhouse effect (sic) — but for the mistakes our country has actually made in closing its eyes to the destruction of biological diversity in whole ecosystems as well as to the desertification and "savannization" of vast portions of our territory.

Floram Project, therefore, may become an earnest and reliable instrument to help the government in designing international policies oriented to environmental issues. The significance of its content in terms of our diplomatic efforts may favor governmental institutionalization of the project. Preliminary disclosure of its goals supports this statement.

On the other hand, facilities to secure and channel the massive funds required and the world trend of endorsing non-governmental organizations (NGOs) recommend privatization.

The key element behind this trend (out of which the institutional framework for Floram Project will emerge) must be what is already under way throughout the world, even in Eastern Europe: to let fast-acting and highly effective private institutions take the lead in a growing number of actions in several fields of human activity.

On the strength of these world trends, the idea is to have a foundation not established under government leadership or some other form of private organization. This would serve as a hub for development of technical projects and environmental and economic studies. It would further foster the afforestation and reforestation practices proposed as well as manage funds obtained for the project from national and international institutions.

In addition to the collegiate bodies required by law for management of the project, a Governing Board comprising acknowledged experts should be established, with representatives from the institution where the Project first emerged — IEA/USP.

Project FLORAM too will have to choose its institutional framework. A great deal of flexibility and common is the aim, with the support of multi-task partnerships.

Once the executive board of the new institution is installed, a strong fund-raising unit will be needed to actually implement the project. Initially and chiefly to develop forests primarily for economic purposes, encouragement will be given to investments by users of the raw materials generated. Such sectors are also expected to finance the installation of the management body and the initial detailed action plans outlined in Floram Project.

Since all reforestation developments aim at a greater cause — carbon fixation to revert the greenhouse effect — resources should be sought at international development banks (e.g. the IBRD, IDB, etc.) for forests of stronger environmental content in the classical sense of the term.

The mega-dimension of Floram Project will demand massive resources, and not just to satisfy Brazilian interests in the program. International demand also has a stake in it, if the project indeed reaches the proportions envisaged by its creators and works as a reservoir to revert excess carbon built up in the atmosphere.

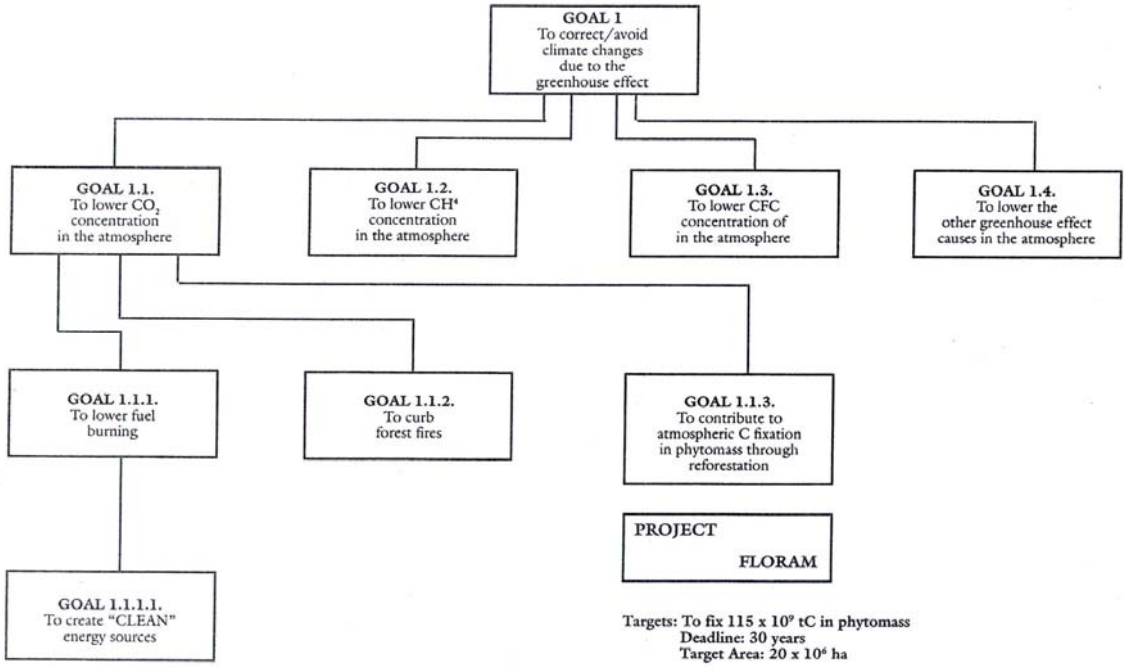
There are no funds earmarked for such a sizable amount of resources in the international economic order. Nor are there allocations for investments geared to the technological revolution resulting from a changeover from the current fossil fuel energy generators to carbon-free fuels such as solar energy coupled to hydrogen technology (Annex).

To create a fund to meet all such demands, it would be enough to set in motion a worldwide drive, endorsed and supervised by the UN, to establish and enforce a tax of roughly one dollar per barrel of crude or equivalent in charcoal or natural gas. The problem lies in motivating such a drive not for lack of media communication — there are enough apocalyptic statements around — but for absence of a magnet to draw together the widespread but scattered anxieties.

Floram Project hopes to be the heart of this drawing together. It can only achieve its primary goal if it manages to trigger the chain reactions needed to revert the greenhouse effect. At the same time, it can strengthen the course and the intentions so appropriately embodied in the Vienna Convention and the Montreal Protocol which have just entered into force with a common global objective: to control depletion of the ozone layer surrounding the earth.

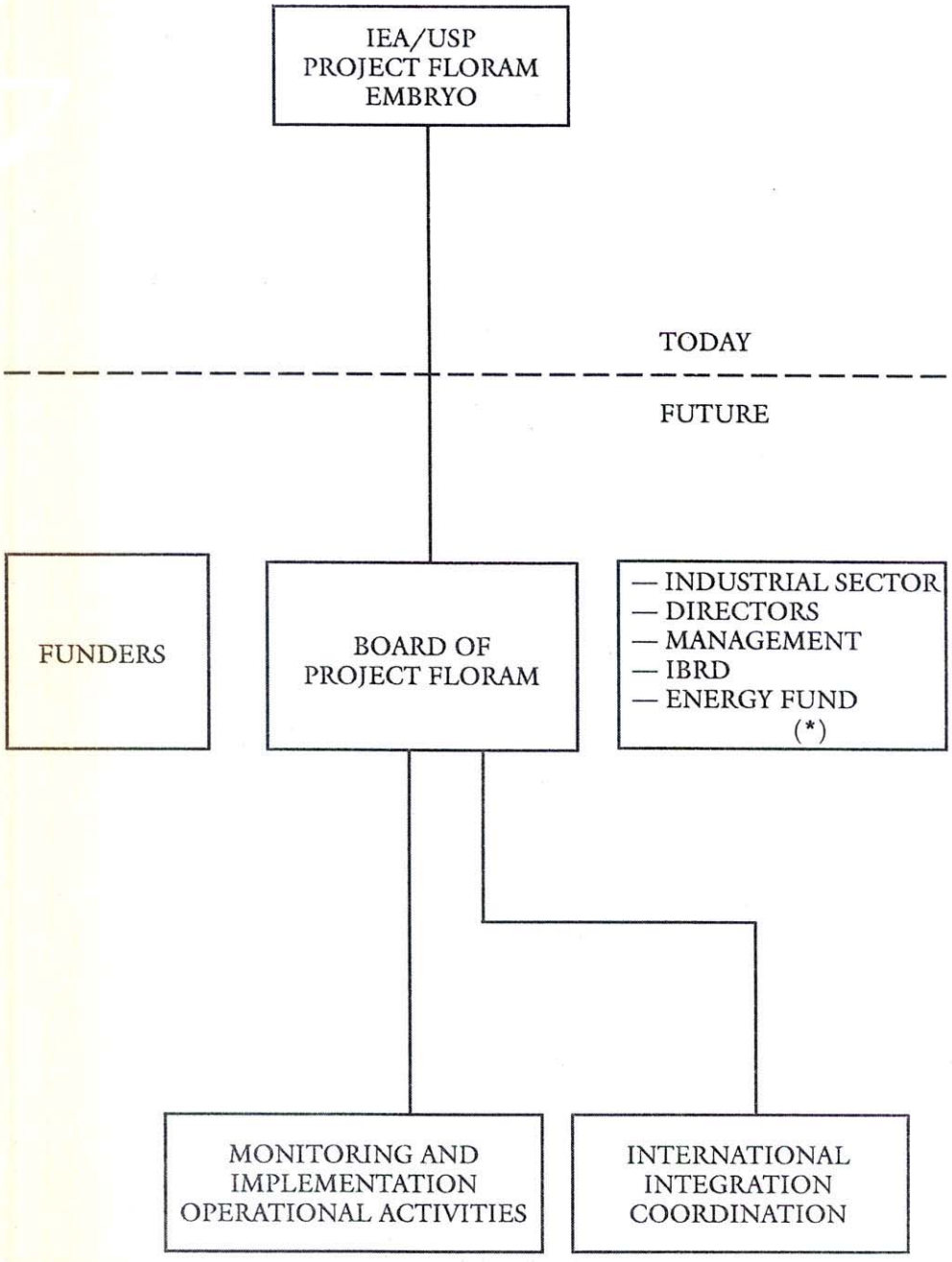
On the technical side, this Foundation should have an expert and multidisciplinary staff, its strength lying in the quality of human resources rather than in numbers. Technical projects, research, and forestry actions must be performed under contract with private specialized companies whenever feasible.

The ideas set forth in this report are not final. They are mere guidelines around which consensus is yet to be fully achieved. That is precisely why they are simply tentative suggestions to be improved upon or, in the worst possible scenario, to be totally modified.



ANNEX A

INSTITUTIONAL DESIGN



(*) International Fund to be Created

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