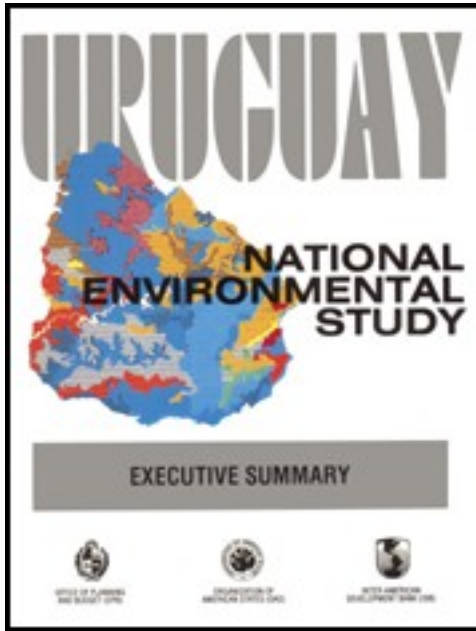


# Uruguay - National Environmental Study - Executive Summary

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[Table of Contents](#)

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**REPUBLIC OF URUGUAY INTER-AMERICAN  
DEVELOPMENT BANK ORGANIZATION OF AMERICAN STATES  
EXECUTIVE SECRETARIAT FOR ECONOMIC AND SOCIAL AFFAIRS DEPARTMENT OF  
REGIONAL DEVELOPMENT AND ENVIRONMENT**

Washington D.C., 1992

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## Table of Contents

---

### Background

[Introduction](#)

[Country description](#)

[Problems to be overcome](#)

### Environmental management

[Policy objectives](#)

[Institutions](#)

[The strategy and its instruments](#)

### Environmental action plan

[Program 1: Strengthening national environmental management capability](#)

[Program 2: Conservation and sustainable use of biodiversity and genetic reserves](#)

[Program 3: Coastal zone management and reclamation.](#)

[Program 4: Management of critical watersheds](#)

[Program 5: Environmental sanitation](#)

[Program 6: Reclamation and sustainable use of natural resources and ecosystems](#)

[Program 7: Energy for sustainable development](#)

[Program 8: Environmental education](#)

[Program 9: Support of economic policy and environmental management](#)

[Implementation](#)



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# Background

---

[Introduction](#)

[Country description](#)

[Problems to be overcome](#)

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## Introduction

On May 4, 1989, the Government of Uruguay and the Inter-American Development Bank signed a technical cooperation agreement to finance a national study that would help incorporate the environmental dimension into the development process of Uruguay.

Concurrently, the Government of Uruguay requested that the General Secretariat of the Organization of American States act as the executing agency of this national environmental study and that the Department of Regional Development and Environment of the Organization of American States provide the necessary technical assistance to the Uruguayan Office of Planning and Budget (OPP).

This document synthesizes the findings of the national environmental study and provides an action plan to implement the strategy, projects and programs that are based on these findings. In summary, the study established that a formal environmental policy was needed to meet the national objectives of improved quality of life for the people of Uruguay.

The strategy is grouped into nine priority programs. These include proposals for technical cooperation, project investment and institutional strengthening all designed to lead to sound environmental management and sustainable development.

*[Figure 1. Location of Uruguay in South America](#)*

## Country description

Together with Argentina, Bolivia, Brazil and Paraguay, Uruguay shares the Plata River Basin and occupies the northern margin of the mouth of this river on the Atlantic Ocean (Figure 1).

The location of Uruguay is somewhat unique in that it is the only country in South America whose entire territory lies within the temperate zone. Further, its coastal location and comparatively level topography create a relatively uniform, temperate climate that is moderate, rainy, and humid. The rolling landscape of Uruguay offers expansive views and distant horizons. The soils are covered with a diverse vegetation of grasslands intercepted by woodlands along the rivers and creeks that also cover the more broken lands

and slopes of the higher areas (Figure 2).

Of the six major watersheds in Uruguay, four are shared with neighboring countries. Both surface and ground water are relatively abundant.

Its coastal ecosystems consist of important wetlands, migrating sand-dunes, and long stretches of beach separated by exposed rocky outcrops. Coastal sites that are sufficiently protected from the elements are few.

A variety of parent material has given rise to an assortment of soils, approximately 40% of which are used solely for grazing. The remaining 60%, the majority of which are deep and relatively high in organic matter and nutrients, are used predominantly for agriculture, but also to supplement ranching. This mixture of topography, soils, climate, native vegetation and abundant water, sustains important ranching and farming enterprises. These activities have reshaped the natural ecosystems and, together with other forms of human settlement, have substantially reduced native wildlife in both number and variety.

Approximately 1.3 million of Uruguay's 3.1 million inhabitants live in Montevideo. Continuous migration from the countryside has created conditions where 87% of the population resides in urban centers. Life expectancy is 68.4 years for men and 74.8 years for women. Almost half of the population receives private health care and nearly 95% can read and write.

### *Figure 2. Natural Vegetation Map*

Economic growth has been conditioned by the high rates of inflation that have occurred in the last few decades. During the period 1979-1983 accumulated inflation amounted to 46%. In the next five years it was 69% and in 1989 it reached 89%. Although strict control measures have been introduced, inflation remains high.

As in all countries of Latin America, economic problems, including a high level of international indebtedness, exist in Uruguay. In an effort to escape these economic problems, added pressure is placed on the country's natural resources which increasingly suffer from lack of management and overuse. The prevalent style of development has caused a slow loss of resources for agriculture and livestock production as well as a deterioration of urban conditions.

Despite the richness of the soils, the abundance of water, and the existing technical and scientific capacities, agriculture production, in terms of crops and livestock, failed to grow in the 1970s and showed little improvement in the 1980s. This production, based on systems of combined cattle and sheep ranching, varies according to the grasses that are available but generally the systems of production are extensive and make use of natural grasses and little human labor.

Agricultural production takes place primarily on the deeper, fertile soils in the south and east and on the south and central alluvial areas along the Uruguay River. In general it is oriented toward cereal production, especially rice. There is also significant production of vegetables and fruits close to Montevideo, the principal market, and in the northern part of the country, in the Uruguay River Basin (Bella Unión and Salto) where a microclimate exists that is appropriate for the cultivation of these products.

The planting of forests was linked to livestock production which required trees for protection and shade

in the natural pastures. Varieties of eucalyptus were planted which became integrated into the rural landscape as groves and wind breaks. In the middle of the last century, along the coasts of the Plata River and the Atlantic Ocean, farm areas and livestock required protection from the movement of sand dunes. This protective forestation used several species of European pine and eucalyptus. However, it was the oil crisis of the last decade that increased forest planting because of the demand for wood as a source of industrial energy. Consequently, the country first used exotic species that were protective and productive; that were readily adaptable and fast growing; and, which provided early regrowth.

Although the forestry sector in Uruguay is traditionally small, in the last few years the State has favored forest activities with fiscal and financial incentives. As a consequence, an export market for round wood and for raw material for paper and sawmills has been opened. Historically, however, forests have been used for both domestic and industrial firewood. Exploitation of native forests is restricted by law although they are still used for construction purposes on farms and ranches and for firewood in urban bakeries and restaurants.

Use of firewood increased considerably after 1983 when many industries changed from fuel-oil to firewood as the basis for their energy. However, a 1989 energy inventory showed that the domestic use of firewood was even greater than that of industry. In 1987, industry completed its conversion and there has been little increase in the use of firewood since that time.

All economic sectors in Uruguay have suffered in recent years. In general terms, the trend in gross industrial product shows no growth in the last decade. Since 1983, when the greatest decline in industrial product occurred, growth was made only in mining and the food industry but these are of little significance in GDP. The transportation sector also made little progress in the last decade. And, tourism, although still an important source of foreign exchange, is responsible for coastal modification and massive use of some of the nation's beach and resort areas.

## Problems to be overcome

In Uruguay, population, the extent and spread of settlements, and the increasing diversity of development activities affect the entire range of natural resources and conflicts between alternative uses of these resources have multiplied.

**Rural Land-Use:** Soil degradation through erosion is generalized in cultivated areas despite relatively low-intensity land-use. Its main effect is to decrease the soil's capacity to sustain historic levels of production. Several important problems can be mentioned:

- Erosion and soil compaction through overuse of farmlands; severely eroded areas in the Department of Canelones and on farmed areas along the Uruguay River; and, introduction of soybean cultivation on erosion prone soils in the eastern part of the country.
- Degradation and loss of productivity of natural pastures due to overgrazing; and poor information concerning natural ecosystems.
- Low demand for laborers; small technical advances concerning extensive livestock production systems, their extractive character and inadequate management.
- Emigration of the rural population; lack of social services; and, little social interaction

between rural families.

- The principal feeding areas of migratory birds in the lowland marshes and lagoons of the Department of Rocha are being degraded and lost due to increased rice cultivation.
- This habitat loss, and the level of persecution and hunting of native fauna, has eliminated some species altogether and substantially reduced the populations of others.
- Growing chemical pollution of rural ecosystems caused by careless and/or excessive use of agrochemicals with unknown consequences for both the food chains and those people who use these chemicals.
- Increasing eutrophication of surface water resources in the more intensively farmed areas.

**Urban Land-Use:** Because of demographic, industrial and other development pressures, the problems of Montevideo have the greatest magnitude and intensity in terms of social impact. Although each situation is different, the urban centers of the interior have some of the same problems. In all cases, these arise from a lack of funds for meeting the increasing demand for infrastructure services. This is particularly evident where environmental sanitation and proper housing have not kept pace with population growth. A number of problems remain to be solved in urban areas:

- Formation of slums in traditional urban areas; growth of shantytowns and jerry-built dwellings on public recreation areas and on the banks of protected waterways.
- Loss of wetlands that help to clean contaminants from run off; and, unsafe and unhealthy living conditions in these areas.
- Loss of valuable urban architectural and historical heritage and disappearance of green spaces and pedestrian corridors in Montevideo.
- Settlement by low-income populations in areas prone to flooding in the riverside cities of the interior.
- Degradation of Montevideo's urban watersheds caused by a lack of sanitation and infrastructure services; obsolete sewerage systems and treatment plants; industrial dumping; poor management of liquid wastes.
- Contamination of Montevideo Bay and the consequent degradation of nearby residential areas causing beaches to be unsafe for swimming (Ramirez, Area Sur, and Carrasco)
- Contamination of bathing, resort, and urban centers of the Department of Canelones by household and industrial liquid wastes.
- Contamination of groundwater.
- Loss of farmland and other areas of production because of urbanization.
- Conflict between organized and haphazard solid-waste collection services in Montevideo; indiscriminate discard of non-biodegradable materials; permanent garbage dumps; and, contamination of urban water bodies with household wastes.

- Lack of proper control in handling and disposal of wastes from hospitals and clinics throughout the country.
- Lack of studies, information and control of solid toxic wastes from industries, which contaminate soil and water, and a lack of knowledge of their effects on public health.
- Lack of criteria for the safe disposal of solid wastes from the cities of the Interior.

**Water Use:** Because of the abundant water resources, awareness regarding their value is a relatively recent phenomenon. Increased demand for irrigation water, recurrent droughts and increasing contamination in the more intensively farmed areas, have raised concern about the quantity, quality and value of these resources and, therefore, about their management. The loss of public beaches and shorelines of rivers and streams-especially in Montevideo and along the Uruguay River-has raised the urban population's understanding concerning contamination. A number of problems have been identified for solution.

- Contamination of surface water by liquid effluent from urban and industrial centers. Smaller streams that receive discharges from urban centers in the interior are of particular importance.
- Contamination of the Uruguay River (primarily from point discharges in the zones of Bella Unión, Salto, and Paysandú).
- Contamination and eutrophication of surface water due to discharges from urban centers, industries, and intensively used farm land areas having high population densities. Critical cases are the watersheds of the Santa Lucia River Basin which supply 60% of the nation's drinking water; the Laguna del Sauce watershed which is the source of drinking water for the cities of Maldonado and Punta del Este; the Pando Creek; and the urban watersheds in the Department of Montevideo.
- Uncertainty as to how other important basins, such as the binational basin of Laguna Merín, should be managed.
- The urban watercourses of Montevideo become open sewers due to the flow of untreated household and industrial effluent escaping from old and deteriorated sewage systems.
- Although ground water quality from wells is generally good, contamination can be detected in aquifers near the bathing resort area of Canelones and in the milk production zones near Montevideo.

**Forests:** The natural forests that occur along rivers and small mountain chains continue to fulfill their roll of protection watersheds. Currently, the predominate form of native forest use is for grazing and selective extraction of timber. The periodic felling of trees for posts and firewood is normal under the existing system of agriculture. Likewise, use is made of many of the services and values normally generated by forests: shelter and shade for livestock; quality water for livestock; refuge and food for wildlife and, recently, for apiculture; watershed protection; control of the water regime; regulation of climate and microclimate; and ecotourism potential. Several important problems have been identified:

- Although apparently self sustaining, the approximately half-million hectares of forest that existed in 1937 were reduced by 20% because of harvesting during this century.

- Selective cutting has degraded the structure and quality of many of the remaining areas of native forest.
- Lack of adequate information on the value of the services provided by native forests; and, their unknown genetic potential.
- A lack of attractive choices for forestry investment alternatives for productive investment that promote water, soil, and wildlife conservation as well as to increase the country's forested area.
- Pressures from agriculture and livestock interests to alter the remaining areas of native forest and other wild-lands. Thirty-six such areas have been identified as being of interest for conservation because they are representative of the country's major ecosystems, or because of their scenic and other nature-based values.

**Atmospheric Contamination:** A national level, air quality control system has not yet been implemented. The Municipality of Montevideo does make measurements but only sporadically and at certain points. The Ministry of Housing, Zoning and Environment (Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente, MVOTMA) is now the authority for air quality control. Several contamination problems exist.

- A lack of equipment, technical capacity and standards of quality for monitoring at the national level.
- Partial measurements have identified specific point sources of pollution from industries in Montevideo and other sites in the metropolitan area. The most important of these are: the oil refinery; thermal plants located on the shores of Montevideo Bay; and, toxic industrial emissions in the Department of San José.
- The eventual transborder contamination generated by the coal fired energy plant at Candiota - The study of which has been arranged by the Governments of Brazil and Uruguay.
- Non-point sources of air contamination include the fleet of obsolete city buses operating in the central zones of Montevideo and on the main traffic arteries of the country.

**Mining:** Increases in mining demand that more effort to reduce externalities be made to avoid future health problems and ecosystem degradation. Present-day mining activity concentrates on the extraction of non-metallic minerals, particularly building materials, such as marble and granite. The most important problems are:

- The need of an explicit mining policy covering environmental quality that would orient companies interested in mining of non-metallic and metallic minerals.
- The mining of non-metallic minerals, while not presenting problems of toxic pollution, raise questions related to occupational hazards. There is increased incidence of silicosis among quarry workers who are mining non-metallic minerals.
- The sites and the methods of sand extraction deteriorate beach quality.



- The lands used for quarries are not restored.

**Tourism:** Positive values for tourism require controlled use and development so as not to exceed their potential. These include scenic areas of interest for ecotourism; marshes, ravines, highland and gallery forests; abundant bird life; shoreline forests that characterize the coastal landscape; urban centers of great interest mainly in the area of Portezuelo and Punta del Este; and, local interest in the preservation of the natural scenic values of the coast (Figure 3). The main attractions for both national and international tourism are the Plata River shore-line and the coast of the Atlantic Ocean. Several problems exist.

- With some outstanding exceptions, indiscriminate, homogeneous urbanization that lacks scenic interest predominates along the entire shoreline east of Montevideo.
- Construction of roads, infrastructure and culverts destroy beaches, and affect the natural dynamics of migrating coastlines.
- Certain uses of beaches destroy the protective vegetative cover and create pathways that allow wind erosion.
- The dumping of waste and the inefficiency of the sanitation services contaminate bodies of water near tourist facilities; the removal of sand degrades important resort areas.
- Illegal invasion of beaches by houses built for tourists along the coastal belt. An extremely controversial use of beaches and activities without clear development objectives are underway in La Paloma and Piriápolis.
- Pending subdivisions, if carried out according to the original plans, will destroy the remaining natural scenic values.
- Makeshift and unplanned tourist accommodations have been built in the most valuable scenic areas as well as in areas of important natural coastal dynamics.
- Threats exist to the remaining and most valuable areas of the coast where human incursion is slight and the fauna has not been infringed upon-particularly the Laguna de Rocha and Cabo Polonio (Figure 4).
- Existence of contradictory national and departmental legislation on coasts as well as uncoordinated, flawed, and outdated cadasters.

*Figure 3. Tourism Areas on the Atlantic Coast*

*Figure 4. Threatened Coastal Areas of Uruguay*

**Energy:** The major source of electrical energy in Uruguay is hydropower. The most important dams are the dam on the Negro River and the binational dam at Salto Grande on the Uruguay River which, together, have a capacity to generate 1566 megawatts. The weakness of the system is that it depends on a climate where droughts frequently occur. During the dry periods, Uruguay uses its capacity for steam generation (368 megawatts) to satisfy peak demands. The third source of energy is forest biomass-primarily eucalyptus-used as firewood for industry and homes. Problems of the energy sector are the following:

- High demand for oil products despite this being a resource which is totally lacking in the country.
- Insignificant use of alternative energy sources.
- Technical limitations to incorporating alternative energy sources-in particular wind power and biomass.
- Lack of technologies to increase domestic energy conservation- especially in low-cost housing.

**Economic and Social Development:** Many positive factors which favor sustainable development exist in Uruguay. Quality livestock products, free of toxins or steroids, are available for export to the most demanding markets; an abundance of soils, flora, fauna and ecosystems of high natural productivity and genetic value that are available for research; the existence of good quality surface and ground water for human consumption and other purposes; and, highly trained human resources that can easily learn new technologies and incorporate scientific advances into the production stream. There are, however, a number of economic and social issues that require resolution if sustainable development is to be achieved in Uruguay.

- Inadequate identification of the productive capacities of natural ecosystems and their potential for promoting equitable and sustainable development.
- The high level of national debt and poor saving capacity limit investment in new forms of development.
- Lack of jobs within the organized economy.
- The need to explicitly incorporate the environmental dimension into both formal and informal education systems.
- Lack of economic, financial, and technical capacities to investigate and invest in agricultural and industrial production.
- The lack of knowledge concerning the true quality of potable water in many urban centers and the high incidence of viral hepatitis and other diseases transmitted through water in certain areas of the country.
- High incidence of diseases: hydatidosis and Chagas in the interior.
- An increase in the mortality rate due to cancer and the uncertainty of its interrelation with the country's environmental situation.
- Urban population growth together with inadequate social infrastructure, especially sanitation, in the cities and areas of more active growth.





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# Environmental management

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[Policy objectives](#)

[Institutions](#)

[The strategy and its instruments](#)

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The preceding analyses clearly identifies the need for Uruguay to formulate an environmental policy and to provide the institutional support necessary to meet its development goals and improve the quality of life of its citizens. Such a policy would advocate explicit program objectives and these, in turn, would require a strategy comprised of specific instruments and activities.

## Policy objectives

The ultimate purpose of an environmental policy is to guide development so as to achieve a satisfactory quality of life for the people of Uruguay, and to make that development sustainable, just and equitable. Within these broad goals, the following objectives are proposed:

- ***Obtain sufficient information on national ecosystems and culture to move toward sustainable development.*** The natural ecosystems of Uruguay are now fully altered and are heavily exploited. Sustainable development will require changes in how both natural and human resources are used. Science and technology-and the information they provide-are fundamental to the process. The generation of information; the transfer and adoption of technology; and, the proper use of these, are required to support a well designed environmental policy.
- ***Advertise Uruguayan products.*** Uruguay, with its small domestic market, requires policies that will guide growth and development within regional and international markets. The more-developed countries produce basic commodities, particularly foodstuffs, through a high degree of ecosystem alteration. However, some economically powerful sectors demand natural products free from contamination. Naturally produced goods are scarce, have high market demand and command premium prices. Many of these can be provided by Uruguay.
- ***Conserve biodiversity including genetic information.*** The natural ecosystems of Uruguay have shown an unusual capacity for sustained production. Conservation and investigation of the less altered ecosystems-especially grasslands-can help define new technologies to intensify livestock production and support other development alternatives. Wetland, forest and coastal conservation, for example, may require their expropriation on behalf of the State or incentives to the owner. Management could be done by specialized public or private organizations.

- ***Eradicate poverty.*** Important sectors of the population live in extreme poverty. The capacity of the nation, including its capacity to save; its levels of development investment; the quality and quantity of urban and rural infrastructure and services; the loss of natural and cultural heritage; the clean up of contaminated water supplies; and, problems in upgrading the industrial sector are all affected. The solution of these problems requires that environmental policy be related to development policy in order to give training, employment and the services needed to improve the quality of life.
- ***Reduce waste and to increase recycling.*** The concept that even used goods have value that can be recovered through recycling is based on solid experience and informed environmental management. This concept is applicable to various scales of productivity and population densities. Meeting this objective will require incentives and financial decisions concerning the scale and dynamics of demand for recyclables to discourage dissemination of contaminating and/or non-biodegradable wastes.
- ***Conserve energy and increase use of renewable energy sources.*** Energy policy is an essential part of environmental policy. Beyond the energy requirement for industry, energy use is related to quality of life. What is required are more environmentally benign energy sources that can be used for commercial application. The generation of electricity from wind is of interest to the country. Although not now capable of substantially affecting commercial energy supply, development of this technology will allow diversification from traditional and, for Uruguay, extremely vulnerable, energy sources.
- ***Develop the various sub-regions of the country.*** This objective is supported by national policies to organize land use; to encourage more balanced and decentralized development; and, to make better and more rational use of natural and human resources. Uruguay's limited geographical size and model of development has favored centralized government and homogeneous policies and actions. Instead of taking advantage of the country's natural capacities, current policies cause local economic and social damage and deterioration of natural values of some of the ecosystems of the country. In order to organize development, coordinated actions will be necessary-especially in critical watersheds where particular attention should be paid to more appropriate uses of their natural capacities.
- ***Strengthen foreign policy on environmental matters.*** This central objective is based on two factors decisive for the future of Uruguay. First, its small size and second, its downstream position within the Plata River Basin between Argentina and Brazil an area where urbanization and industrial development are the greatest in South America. Beyond the formulation of internal environmental policies, this objective reflects the national priority to orient the country's foreign relations with a sound environmental policy, particularly within the framework of the Southern Common Market (Mercado Común del Sur, MERCOSUR).
- ***Maintain locally shared environmental control.*** Environmental management that is socially relevant requires a socially aware population as well as the means to direct government and private actions with consistency. This, in turn, requires a strengthened formal education system that integrates both the individual citizen and the society into a context where environmental science can play a role. Increasingly, mass media and social

organization have a larger, more positive role to play in the dissemination, investigation, and use of environmental guidelines and values. At the same time, these two components constitute the most effective mechanisms for promoting concern for environmental quality. Likewise, legislation that takes a global approach and which has social consensus supports the objective of maintaining the quality of life.

## Institutions

Human environments include the natural and man-made attributes of ecosystems-including the economic activities and human settlements based on the development of these resources. The interactions between all of these affect the work of virtually all state or government institutions. Despite this, agencies have traditionally received mandates for managing narrow sectoral matters and for exploiting specific natural resources without much consideration of other interests. Under this model, duplication of effort occurs in some cases while untreated gaps occur in others. This is particularly so in the areas of ecosystem management, biodiversity conservation, integrated research and the relationships between economics and other environmental concerns.

Nongovernmental organizations (NGOs) in Uruguay can play a large role in environmental management-in reporting cases of contamination, providing environmental education, in helping to control the effects of hazardous events and in the conservation management of biodiversity. However, they have not had the capacity to permanently manage the investigations and surveys required to play this role. Nor can they generally undertake major activities to avoid or resolve environmental management conflicts. The recent establishment of a network of national environmental NGOs in Uruguay is a step towards both a common program and improved capacities in environmental management.

In June of 1990, the Ministry of Housing, Zoning, and Environment (MVOTMA) was created to provide a necessary instrument for coordination, planning and assessment of environmental impacts, and for monitoring environmental quality. These activities are to be accomplished, in part, through the work of three directorates: the National Housing Directorate, the National Land-use Zoning Directorate (DINAOT) and, the National Environmental Directorate (DINAMA). However, the establishment of this institution does not obviate the responsibility of other government organizations and institutions to develop their own environmental awareness. Consequently, policies ratified by framework legislation and other instruments that enable the execution of environmental management policies are essential.

Institutional gaps have been identified in MVOTMA's operational structure that require several decisions at the level of government institutions: i) to coordinate the work of the ministries at the technical level; ii) to create flexible and fully supported instruments to coordinate policies of other government agencies; and, iii) to strengthen mechanisms for executing environmental policies including the participation of private organizations.

## The strategy and its instruments

To insure that these objectives are met, a strategy to redirect growth toward just and equitable sustainable development is required. Given the broad range of possible actions, the strategy is to direct and

coordinate government and private activities without sidetracking private initiative or creating overly bureaucratic institutions. The strategy includes instructions for institutional arrangements, education programs, social organization, legislative instruments, economic adjustments, technical cooperation and a design to locate the necessary financing. The recommended activities follow:

- ***Adjustment of existing institutional arrangements.*** Increased support of an inter-institutional system of environmental management, coordinated by MVOTMA is proposed. The purpose is to reinforce each agency's role in monitoring and controlling environmental quality in areas where they work.
- ***Promotion of environmental education.*** Within the framework of sustainable development, methods of both formal and informal education are necessary to incorporate the values, guidelines, scientific understanding and technology of environmental quality into the behavior of the nation's citizens.
- ***Use of public and private organizations.*** The strategy will provide incentives to encourage the responsible participation of community organizations such as businesses, unions, and environmental non-governmental organizations. It is proposed to include their official participation in the conservation of biodiversity, management of conservation areas and support for research in specific areas of interest.
- ***Creation of a legal framework for environmental management.*** The strategy requires "global environmental legislation" which would serve as the framework to coordinate the individual and collective responsibilities of the public and private institutions involved in environmental management.
- ***Adjustments in economic policy.*** A group of mechanisms are proposed that give financial support to environmental management, penalize degrading activities, provide incentives for the sustainable use of threatened resources and place realistic values on the many goods and services provided by nature. In this regard it will support the "Environment Fund" created in the budget legislation of January, 1991.
- ***Incorporation of technical cooperation.*** A number of areas of expertise are required to meet the objectives being proposed in the overall strategy. When the expertise does not exist in the country it will be sought through the planned use of technical cooperation provided by other nations and international organizations.
- ***Generation of information: research, surveys and studies.*** It is impossible to encourage sustainable use of natural resources if their essential characteristics are not adequately known. Therefore, it is necessary to give priority to research on:
  - The natural characteristics of ecosystems and their use particularly, the productive, scenic, and aesthetic values of the sea coast, pasture, wetlands, and native forest ecosystems must be evaluated;
  - The genetics of native vegetation and fauna;
  - Development of germplasm and gene banks;
  - Conservation of endangered fauna;

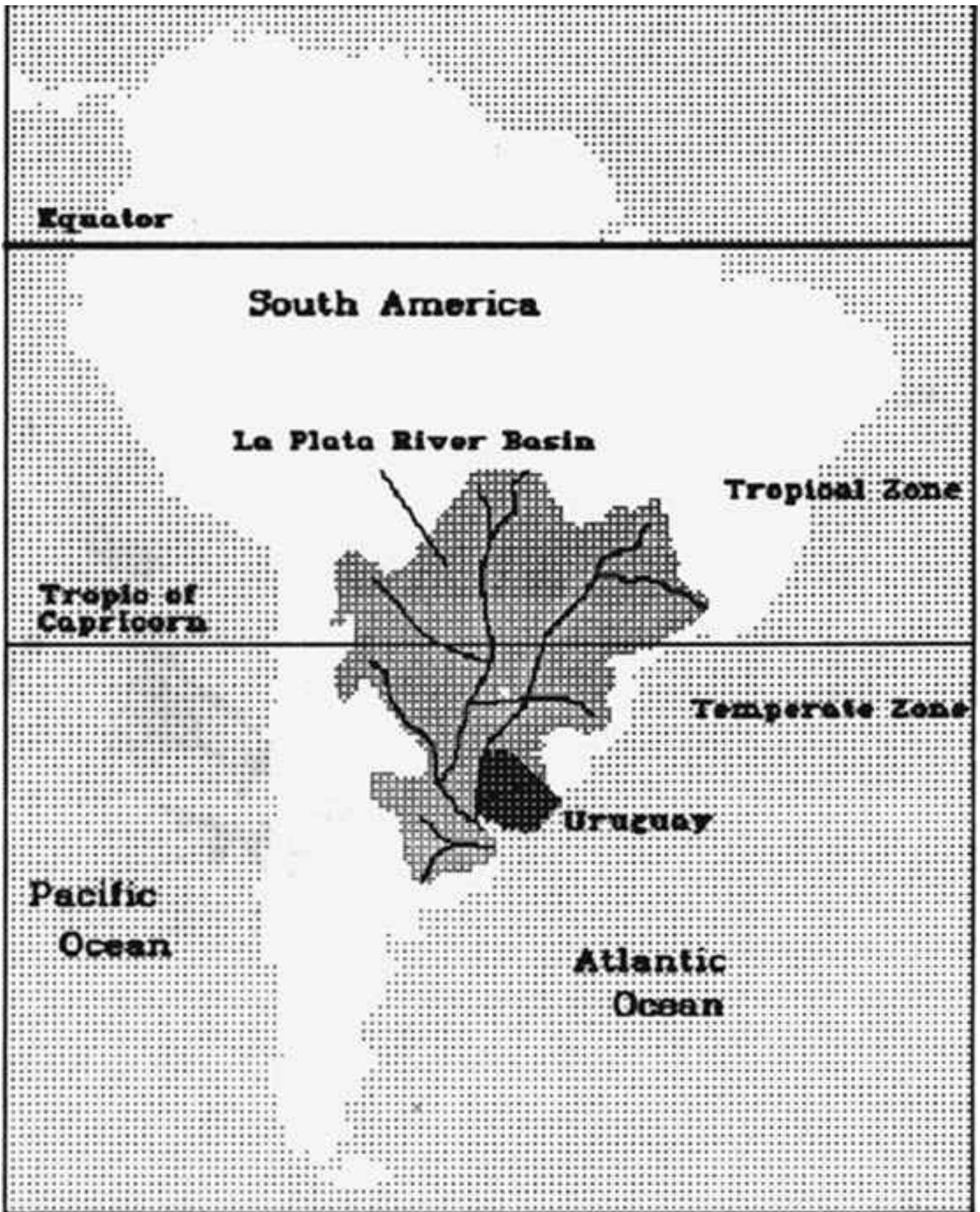
- Recovery and recycling of urban, industrial and domestic wastes;
- Management of biological and chemical pollution of water resources and treatment systems;
- Chemical and biological control of contamination; and,
- Relationship between environmental degradation and public health.

• ***Investments in priority issues.*** Redirecting the existing approach to development requires careful intervention on the part of government. The Environmental Action Plan (EAP) being proposed will help orient and organize the strategy's priority activities and these will require investment. The government will support the institutions and organizations that are available for financing execution of the proposed activities. They include:

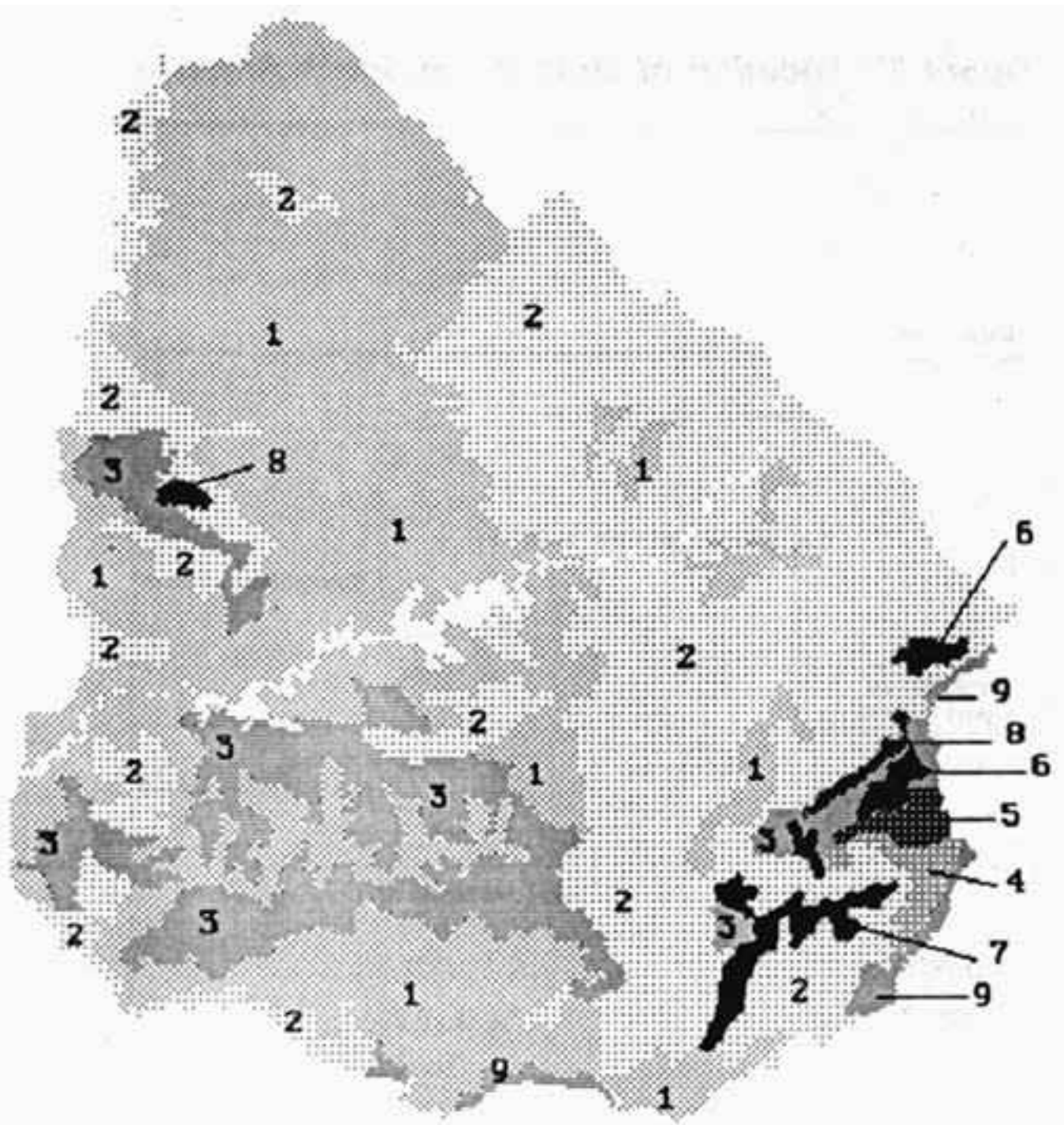
- Creation of a National System of Protected Areas (NSPA);
- Ecotourism Development;
- Coastal Zone Reclamation and Management;
- Rezoning of Tourism Settlements;
- Management of Critical Watersheds;
- Sewage and Urban Sanitation;
- Building of Treatment Plants for Industrial Emissions;
- Reclamation and Sustainable Use of Natural Ecosystems and Resources; and,
- Design and Construction of the Country's First Energy Farm Using Wind as the Energy Source.





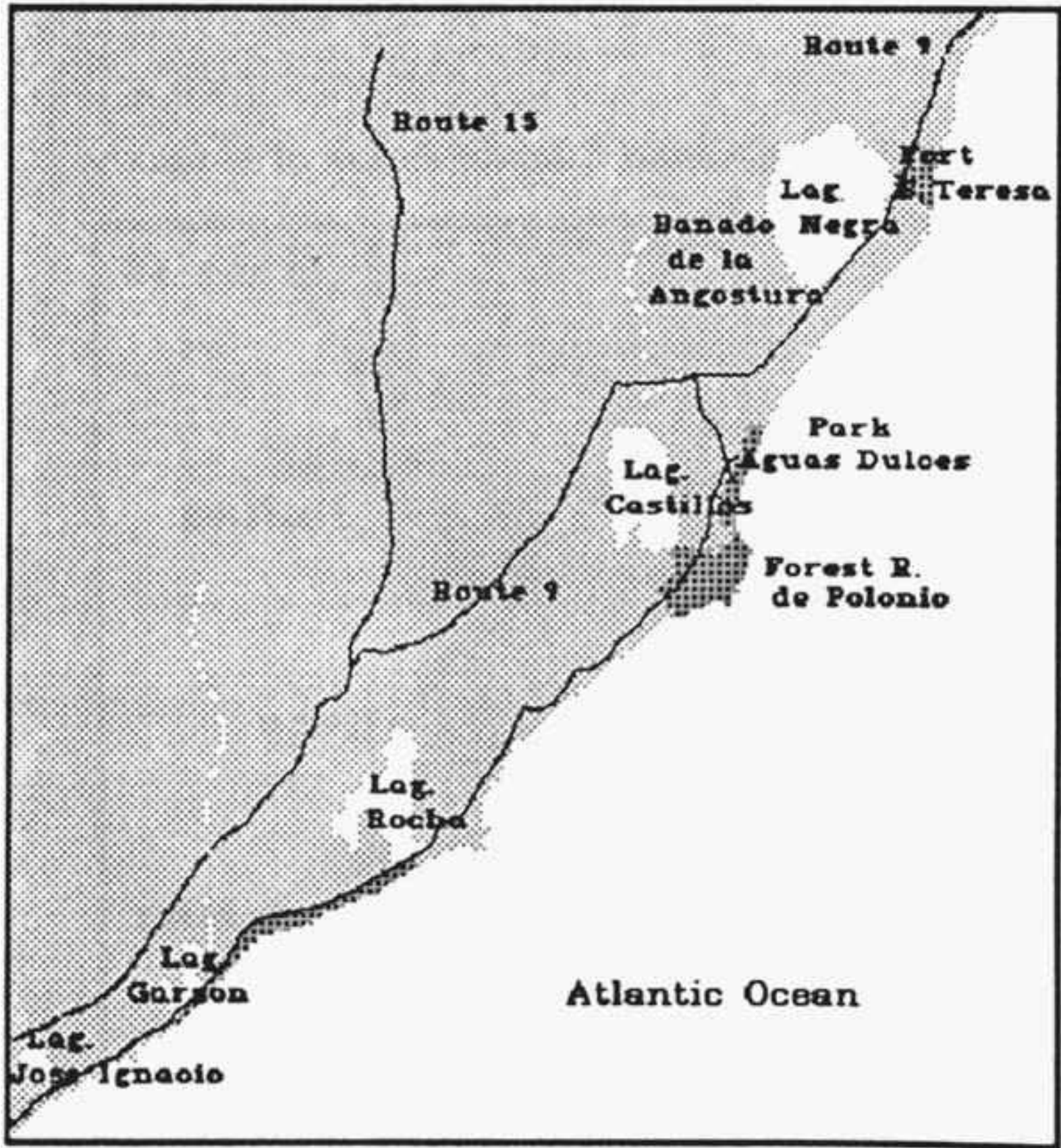


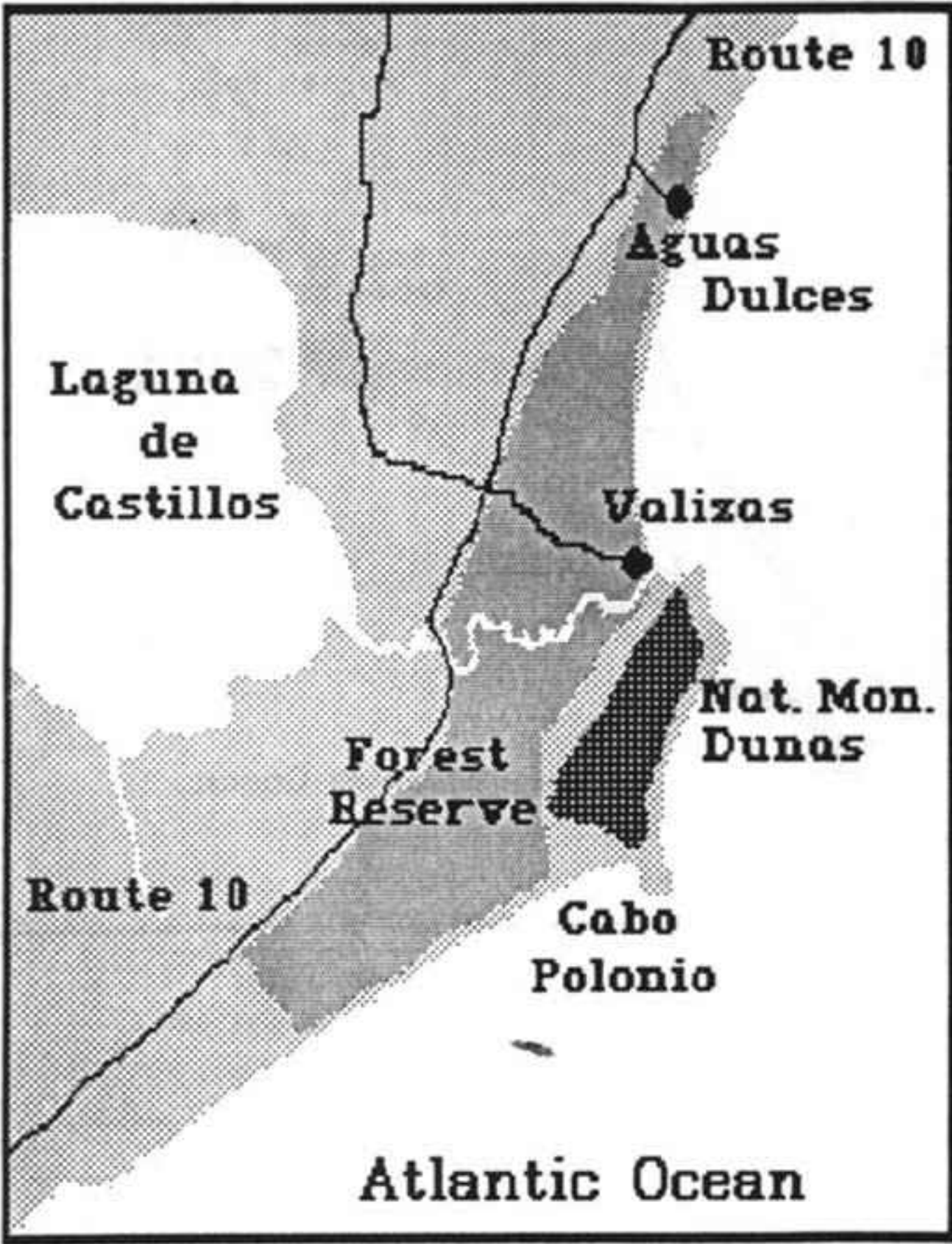




**Legend:**

- |                              |                          |
|------------------------------|--------------------------|
| 1. Grassland (winter)        | 6. Palm groves, wetlands |
| 2. Grassland (summer)        | 7. Chaparral             |
| 3. Grassland (winter/summer) | 8. Riparian forests      |
| 4. Wetlands                  | 9. Wetlands, grasslands  |
| 5. Grasslands, wetlands      |                          |







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# Environmental action plan

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[Program 1: Strengthening national environmental management capability](#)

[Program 2: Conservation and sustainable use of biodiversity and genetic reserves](#)

[Program 3: Coastal zone management and reclamation.](#)

[Program 4: Management of critical watersheds](#)

[Program 5: Environmental sanitation](#)

[Program 6: Reclamation and sustainable use of natural resources and ecosystems](#)

[Program 7: Energy for sustainable development](#)

[Program 8: Environmental education](#)

[Program 9: Support of economic policy and environmental management](#)

[Implementation](#)

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The activities of the EAP have been grouped into nine priority programs (Figure 5). These programs summarize the guidelines recommended to government institutions and outline the short and medium term needs for technical cooperation, financial arrangements and institutional strengthening. The priority activities are presented in the form of project outlines that can serve as general terms of reference for subsequent preinvestment or investment studies.

## Program 1: Strengthening national environmental management capability

This program will provide the institutional setting and support required to implement the EAP. The program will generate regulations, incentives, and specific instruments to help channel government and private efforts towards sustainable development and improve current and future quality of life. Its immediate objectives are:

- Establish the National Environmental Council which will help to introduce environmental concerns into national development policy.
- Strengthen MVOTMA, including a Programming and Projects Unit, to coordinate programming and project execution and, to monitor the EAP.
- Support public institutions and provide incentives to the executing agencies to design and implement environmental management activities.
- Strengthen the capacity of DINAMA to control and regulate environmental quality.

- Undertake the studies and activities required to execute the programs and projects of the EAP.
- Strengthen the capacity DINAMA to regulate waste recycling and control dissemination of non-biodegradable materials.
- Introduce the environmental dimension in economic and budgeting policies of the nation.
- Strengthen Uruguay's international level activities concerning environmental management.

The EAP is based on the participation of national organizations as well as of international technical cooperation agencies. Its structure rests on four specific projects.

**1. Establishment of a Programming and Projects Unit.** This project is to increase the capacity of MVOTMA for programming and coordinating execution of EAP activities as well as to follow-up and monitor the EAP. In addition, it will help ensure on-going study of priority projects and the identification of new projects.

Coordinating Institution: MVOTMA

Executing Agencies: Office of Planning and Budget; Ministry of Livestock, Agriculture and Fisheries (MGAP); Ministry of Economy and Finances; Ministry of Foreign Affairs; Council of Directors of the Public Education Administration; Ministry of Transportation and Public Works; Ministry of Industry and Energy; Ministry of Public Health; Municipal Governments; and, the University of the Republic.

Nature of the Project: Technical cooperation to strengthen national institutions.

Costs and Financing:

Total Cost: US\$ 1,100,000

External financing: US\$ 902,000

National counterpart funds: US\$ 198,000

**2. Strengthening DINAMA.** This project will strengthen DINAMA (of MVOTMA) by increasing its capacity in environmental management through execution of five sub-projects:

- *National Environmental Information System* will create a network of institutions that generate information useful to environmental management. Its structure will be based on a program of key themes that will allow monitoring, use, management and public diffusion. The computerized network will function within DINAMA. Financing has already been secured from the European Community.
- *Control of Toxic Chemicals and other Dangerous Products.* This sub-project consists of a complete inventory of industries to detect their contributions to soil, water and atmospheric contamination. The project will also monitor water for toxic chemicals; develop toxic materials data base; install bioassay laboratory; develop a program to control toxic chemicals from industrial outfalls; formulate a program to control atmospheric contamination nation-wide; study alternatives for disposal of toxic solid wastes; establish a site for the deposit of radioactive wastes. Execution of this sub-project depends on DINAMA in coordination with the Uruguayan Chamber of Industries.
- *Quality Control of Potable Water.* This sub-project is to independently analyze the quality



of the nation's drinking water. The analysis will be done on water taken at the tap and will include both biological and chemical analyses. The executing agency is DINAMA.

- *Control and Disposal of Urban Household Waste.* This sub-project will create within DINAMA the capacity to advise and supervise the municipalities concerning the management and disposal of their urban solid wastes (household, industrial and hospital). Execution belongs to DINAMA and the 19 municipal intendencias.

- *Assessment of water Quality in the Santa Lucia River Basin.* The Santa Lucia River Basin Is the source of the potable water for 60% of the population of the country. Since the quality of this water depends on the production activities and human settlements In two sub-basins these activities and settlements must be closely managed and controlled. According to the Uruguayan Water Code, these waters should be classified so that a legal framework, which will determine how these sub-basins will be used, can be created. This sub-project will arrive at agreements between the various users so that the potability of water from the basin will not be diminished. Execution of this project will depend on DINAMA in coordination with the State Sanitary Works (OSE), Municipalities, MGAP and MTOP.

## **Figure 5 ENVIRONMENTAL ACTION PLAN**

### **PROGRAM 1: STRENGTHENING NATIONAL ENVIRONMENTAL MANAGEMENT CAPABILITY**

- Strengthening DINAMA
- Establishment of a Programming and Projects Unit (PPU)
- Strengthening Uruguay's foreign policy on environmental matters
- Introduction of environmental management issues into economic policy and budgetary programming

### **PROGRAM 2: CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY AND GENETIC RESERVES**

- Creation of a national system of protected areas
- Ecotourism development
- Conservation of the "venado de campo"
- Production of native fauna

### **PROGRAM 3: COASTAL ZONE MANAGEMENT AND RECLAMATION**

- Coastal zone management
- Beach conservation and restoration
- Coastal zone cadastre and legislation for coastal conservation
- Zoning of tourist settlements

### **PROGRAM 4: MANAGEMENT OF CRITICAL WATERSHEDS**

- Management of the Santa Lucia river basin
- Management of the Arroyo Miguelete watershed
- Management of the Arroyo Pando watershed

- Management of the Laguna del Sauce watershed
- Management of the Laguna Merín basin;
- Management of the Arroyo Panianoso watershed
- Management of the Arroyo Carrasco basin

#### **PROGRAM 5: ENVIRONMENTAL SANITATION**

- Development of ten treatment plants for urban liquid wastes
- The introduction of a system of control standards for air contamination
- Sanitation project for the Interior of the country
- Sanitation of Montevideo
- Development of appropriate technologies for the disposal and/or treatment of effluent
- Management of the solid wastes of Montevideo
- Environmental sanitation of Canelonas

#### **PROGRAM 6: RECLAMATION AND SUSTAINABLE USE OF NATURAL RESOURCES AND ECOSYSTEMS**

- Afforestation
- Valuation of the natural services provided by forests
- Sustained livestock production on natural pastures
- Land-use zoning

#### **PROGRAM 7: ENERGY FOR SUSTAINABLE DEVELOPMENT**

- Wind-power farm
- Household energy conservation

#### **PROGRAM 8: ENVIRONMENTAL EDUCATION**

- Environmental education projects of the National Administration of Public Education (NAPE)
- Informal environmental education
- Environmental Sciences Institute

#### **PROGRAM 9: SUPPORT OF ECONOMIC POLICY AND ENVIRONMENTAL MANAGEMENT**

- Establishment of a national system of environmental accounts
- System of natural resource accounts

Coordinating Institution: MVOTMA acting through DINAMA.

Nature of the Project: Technical cooperation for institutional strengthening.

Costs and Financing:

Total: US\$ 1,304,500

External Funding: US\$ 1,046,000

National Counterpart: US\$ 258,000

**3. Strengthening Uruguay's Foreign Policy on Environmental Matters.** This project will support the Ministry of Foreign Relations in formulating Uruguay's foreign policy on environmental matters.

Coordinating Institution: Environmental Directorate of the Ministry of Foreign Affairs.

Nature of the Project: Technical cooperation.

Costs and Financing:

US\$ 14,800 financed by the National Program of Technical Cooperation of the OAS.

**4. Introduction of Environmental Management Issues into Economic Policy and Budgetary Programming.** This project will outline the specific actions of the Planning and Budget Office of the Presidency of the Republic with respect to the implementation of economic measures proposed in the Environmental Action Plan (EAP).

Executing Institution: Office of Planning and Budget together with the participation of the Ministry of Economy and Finances.

Nature of the Project: Technical cooperation.

Costs and Financing:

US\$ 14,000 financed by the National Program of Technical Cooperation of the OAS.

## **Program 2: Conservation and sustainable use of biodiversity and genetic reserves**

This program is to analyze the information contained in the national physical and biological database, and propose how the information should be incorporated in the formulation of development policies. It also supports the establishment and management of conservation areas. These areas constitute scientific, technological, scenic, and cultural reserves which can support medium- and long-term development.

**1. Creation of a National System of Protected Areas.** Thirty-six areas have been identified as potential sites for conservation. These include marshlands, unusual woodland formations, areas containing species of special interest, coastal ecosystems, extraordinary landscapes, and areas of historical and cultural value. Three such areas have been selected that include coastal and wetland ecosystems, native forests and native pastures that will be classified according to IUCN guidelines. The project will mark the boundaries of each and define their land ownership status according to their management plans. Private participation will be sought throughout the process of defining the system. Appropriate legislation will be recommended to support the decisions and institutions involved in the system's management.

Coordinating Institution: MVOTMA.

Executing Agencies: MGAP through the Directorate of Renewable Natural Resources (DNRNR) and OPP.

Nature of the Project: Investment and Technical cooperation.

Costs and Financing:



Total: US\$ 386,000

Technical cooperation: US\$ 276,000

National Counterpart: US\$ 110,000

US\$ 150,000 of financing has been approved by the National Preinvestment Fund.

**2. Ecotourism Development.** This project will create and finance an effective mechanism for the conservation of Uruguay's natural and cultural heritage and to provide the means to support regional socioeconomic development. Preinvestment studies will look into the investment alternatives to increase ecotourism potential and will include studies of infrastructure, equipment and services as well as an analysis of demand and a description of the market. Priority will be given to areas on sea coast, wetlands and, native forests in the north and central parts of the country.

Coordinating Institution: MVOTMA.

Executing Agencies: Ministry of Tourism, Private land-owners.

Nature of the Project: Technical cooperation, Financing.

Costs and Financing: Not yet defined.

**3. Conservation of the "Venado de Campo".** Uruguay has the largest remaining population of this almost extinct species of deer. This project will support private conservation activities and create research centers to gather data and other information necessary to sustainably manage endangered species. Existing and on-going studies as well as management efforts by private landowners will be examined in order to define a concrete strategy for the conservation of this species.

Coordinating Institution: MVOTMA.

Executing Agencies: MGAP/DNRNR, Private Landowners.

Nature of the Project: Technical cooperation, International Workshop, Financial Support.

Costs and Financing:

Total: US\$ 140,000

Technical cooperation: US\$ 125,000

National Counterpart: US\$ 15,000

**4. Production of Native Fauna.** This project seeks to help conserve species of native fauna that already possess certain economic value and whose commercial production could benefit socioeconomic development. Nutria, capybara, cayman, and heron are proposed as the first species to be used.

Coordinating Institution: MVOTMA.

Executing Agencies: MGAP/DNRNR, Private Landowners.

Nature of the Project: Technical cooperation.

Costs and Financing: Not yet defined.

# Program 3: Coastal zone management and reclamation.

This program will provide incentives and other instruments to regulate management of the country's coastal areas. It includes reclamation and conservation of those beaches and landscapes under greatest pressure from tourism and other uses. Reclamation efforts are to include beach conservation and renewal; beach cleanups; user education; development of alternatives for recreation; and, gearing legislation to coordinate objectives of national and departmental authorities. Other areas, such as those that are being overtaken by uncontrolled tourist settlements, also require specific actions and solutions.

This program complements the Program for the Management of Critical Watersheds (including the coastal basins such as Laguna del Sauce, Laguna Merín, and the Atlantic Coast), and also with the Program of Conservation and Sustainable Use of Biodiversity and Genetic Reserves, which includes lightly used areas of the Atlantic Coast.

**1. Coastal Zone Management.** This project will use zoning as an instrument of environmental regulation of coastal resources in an effort to develop tourism while not harming the natural resources. It will include projects that contain both general and/or local activities that are compatible with one another.

Coordinating Institution: MVOTMA.

Executing Agencies: Prefectura Nacional Naval.

Nature of the Project: Technical cooperation.

Costs and Financing: Not yet defined.

**2. Beach Conservation and Restoration.** This project will address the problem of further sand loss through erosion and use in the most deteriorated beaches. It will ensure cleanliness and conservation of beach areas through education programs for both tourists and the general population. The project will build protective fencing on eroded or erosionable areas to trap the sand and, encourage vegetation growth. It will eliminate fixed structures in areas where active beach building is underway and select points where overland runoff should be collected as well as to provide the appropriate equipment and services for beach cleanup.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Prefectura Nacional Naval. CODICEN, through the "Universidad del Trabajo" of Uruguay, Municipalities of Canelones, Maldonado and Rocha, and Community Organizations.

Nature of the Project: Technical cooperation.

Costs and Financing:

Total: US\$ 585,100

Technical cooperation: US\$ 486,600

National Counterpart: US\$ 98,500

**3. Coastal zone cadastre and legislation for coastal conservation.** This project will classify ownership and coordinate a cadastral database as well as integrate the norms to regulate conservation activities for scenic areas and coastal ecosystems. It will seek to reconcile the carrying capacity of the resources with preservation of their fundamental values through coordination of national and departmental legislation.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Municipalities of Canelones, Maldonado and Rocha; the National Directorate of Cadastre of the Ministry of Economy and Finance.

Nature of the Project: Technical cooperation.

Costs and Financing:

Total: US\$ 38,000

External Funding: US\$ 31,000

National Counterpart: US\$ 7,000

**4. Zoning of Tourist Settlements.** This project will consist of basic studies to determine the most appropriate disposition of existing spontaneous settlements, tourist subdivisions and urbanization which degrade or threaten coastal resources (beaches, rocky areas, fishing grounds, outstanding landscapes, and other ecosystems). Regulatory plans for the reclamation of Piriápolis and the bathing resort and service area of La Paloma are to be included. Also of importance because of its fauna and because of its scenic value, is the Laguna de Rocha. Actions will be taken to settle the issues of the illegal tourist settlements that have invaded Aguas Dulces, Punta del Diablo and Valizas. Financing will allow the development of site specific regulatory plans.

Coordinating Institution: MVOTMA/ DINAMA/ DINAOT.

Executing Agencies: Municipalities and Private Organizations.

Nature of the Project: Technical cooperation, Financing.

Costs and Financing:

Total: US\$ 122,000

External Funding: US\$ 110,000

National Counterpart: US\$ 12,000

## **Program 4: Management of critical watersheds**

This program's intent is to restore the productive capacities of watersheds, decrease the level of controversy over their use, and strengthen local and national capabilities to guide sustainable development. Because each watershed suffers specific problems, separate actions that fit within the overall national framework of the project as well as within the policies of regional integration are justified.

**1. Management of the Santa Lucia River Basin.** This is a sustainable development project involving participation of the social and productive sectors of the Santa Lucia River Basin. It will provide the instruments and mechanisms necessary to control water quality in the Santa Lucia River and to foster

development for a better quality of life for the local population. Activities will be made up of the following components: zoning of the basin and the selection of pilot watersheds where management will take place; construction of urban and industrial sanitary services and control of point sources of chemical and organic water contamination; development of integrated and sustainable systems of horticulture and horticulture based industries; watershed protection; reforestation for both protective and productive purposes; monitoring; and, institutional management of the project.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: OSE, MGAP, and five municipalities, and private organizations.

Nature of the Project: Pre-feasibility level study, Technical cooperation.

Costs and Financing:

Total: US\$ 448,500

External Funding: US\$ 324,500

National Counterpart: US\$ 124,000

**2. Management of the Arroyo Miguelete Watershed.** This project is to rehabilitate the Arroyo Miguelete watercourse for public use and to improve the quality of life of those who live within the basin. This implies environmental sanitation of the waterway and the surrounding area as well as guidelines for management of its resources and services, the generation of jobs, and the improvement of basic services. The various components of the project are: urban zoning and development of local services; classification of local water bodies according to the National Water Code; basic sanitation following the Montevideo Sanitary Plan; management and recycling of waste; social organization and training; and, monitoring of project execution.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Municipality of Montevideo, local private organizations.

Nature of the Project: Technical cooperation for pre-feasibility studies.

Costs and Financing:

Total: US\$ 342,800

External Funding: US\$ 267,300

National Counterpart: US\$ 75,500

**3. Management of the Arroyo Pando Watershed.** The project is intended to resolve the Arroyo Pando water-use controversies through watershed management planning. Controversies over water-use result in local and national health problems and damage the quality and productivity of farm crops as well as conflict with recreation, tourism, and industrial-development activities.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Municipality of Canelones, OSE and MGAP.

Nature of the Project: Technical cooperation to design pre-feasibility level studies.

Costs and Financing:

Total: US\$ 10,000

External Funding: US\$ 10,000

**4. Management of the Laguna del Sauce Watershed.** This project consists of a feasibility study of alternative solutions for the problems of this watershed given its pressures of current and future use. Two major aspects are involved: the watershed as a source of potable water; and, the reclamation of the Portezuelo (Punta Ballena) beach for tourism. This project is of particular economic and environmental interest for the country because of its coverage of the area of Punta del Este.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Municipality of Maldonado, OSE, Ministry of National Defense, National Navy, MTOP, and MGAP.

Nature of the Project: Technical cooperation for pre-feasibility level studies.

Costs and Financing:

Total: US\$ 60,000

External Funding: US\$ 50,000

National Counterpart: US\$ 10,000

**5. Management of the Laguna Merín Basin.** The project will prepare the terms of reference for a feasibility study for the integrated and sustainable development of the Laguna Merín basin. The effort is to be accomplished together with the Uruguay/Brazil Laguna Merín Commission (LMC).

**6. Management of the Arroyo Pantanoso Watershed.** This project is similar to that for the Arroyo Miguelete watershed, although, here, the emphasis is on industrial reconversion and on the installation of treatment plants for urban and industrial wastes.

**7. Management of the Arroyo Carrasco Basin.** This project is also similar to that of the Arroyo Miguelete and Pantanoso watersheds.

## Program 5: Environmental sanitation

This program will generate and support solutions to eliminate current soil and water contamination problems caused by deficient or insufficient handling of urban effluent and solid wastes. It may also help to generate air quality information on a national basis. Some of the more important projects of this program are:

**1. Development of Ten Treatment Plants For Urban Liquid Wastes.** Financial studies by the National Preinvestment Fund (FONADEP), under a OPP/IDB Agreement are being executed for the cities of Rivera (defined project); Fray Bentos (draft project);

Tacuarembó (study of options); Melo (draft project); Florida (defined project); and Artigas (draft project). Studies are yet to be initiated for the treatment plants of Rocha, Trinidad, Santa Lucia, and San Carlos.

**2. The Implementation of a System of Control Standards for Air Contamination.** This project will finance actions to monitor air quality on a national level. Particular consideration should be given to the

recommendations of the "Acta de Yaguarón" between Brazil and Uruguay for the area of impact from the coal-fired energy complex at Candiota.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agency: National Directorate of Meteorology of the Ministry of National Defense, Municipalities.

Nature of Project: Technical cooperation and investment.

Costs and Financing:

Total: US\$ 40,000

External Funding: US\$ 32,000

National Counterpart: US\$ 8,000

**3. Sanitation Project for the Interior of the Country.** On a basis of established priorities, the project is to identify the environmental problems of interior cities having populations over 5.000 and of the urbanized resorts of the Plata River and Atlantic Ocean.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: OSE, eighteen municipalities from the interior of the country.

Nature of Project: Technical cooperation to elaborate pre-feasibility studies.

Costs and Financing:

Total: US\$ 500,000

External Funding: US\$ 450,000

National Counterpart: US\$ 50,000

**4. Sanitation of Montevideo.** The master plan for this project is being completed by the national government in cooperation with the municipal government of Montevideo, and the IDB. It is to analyze the status of the sanitary infrastructure and services for the city of Montevideo; prepare an overall strategy of environmental sanitation for the city; and, prepare an application for financing the recommended activities.

**5. Development of Appropriate Technologies for the Disposal and/or Treatment of Effluent.** This project will continue two studies already in progress for adapting low-cost technologies for disposal and/or treatment of household and industrial wastes.

Coordinating Institution: The Hydraulic Engineering School, The Technical Laboratory of Uruguay (LATU), and DINAMA in coordination with the Chamber of Industries.

Nature of Project: Technical cooperation for pre-feasibility level studies.

Costs and Financing:

Total: US\$ 200,000

External Funding: US\$ 180,000

National Counterpart: US\$ 20,000

**6. Management of the Solid Wastes of Montevideo.** This project is to provide technical support to the municipal government's policy for handling and recycling urban, hospital and solid wastes. It will design investment projects to reinforce the cities sanitary services. The project will classify wastes at their point of origin and develop industrial recycling methods that assure their sanitary handling. The project has two complimentary components: a global restructuring of the system of solid waste collection in Montevideo including institutional/organizational aspects; education and training; the establishment of technical standards; provision of equipment; and, the organization of collection services, collectors and recycling services. The second component is centered in the secure management of the wastes generated from hospitals and health clinics. Emphasis will be given to training, establishment of technical standards for waste management in the interior of the country, collection and secure disposition of wastes; and, in providing the necessary equipment.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Municipality of Montevideo through the Directorate of Services and Works of the Ministry of Public Health and, the State Health Services Administration.

Nature of Study: Pre-investment study.

Costs and Financing:

Total: US\$ 80,000

External Funding: US\$ 65,000

National Counterpart: US\$ 15,000

**7. Environmental Sanitation of Canelones.** This is a pilot project to use appropriate technologies for the disposal of urban solid wastes and liquid effluent. The production of compost from this project will be used to rehabilitate deteriorated ecosystems of the department of Canelones. A feasibility study is considered necessary.

Coordinating Institution: MVOTMA/DINAMA.

Execution Agency: Municipality of Canelones.

Nature of Project: Investment study.

Costs and Financing:

Total US\$ 120,000

External Funding: US\$ 100,000

National Counterpart: US\$ 20,000

## **Program 6: Reclamation and sustainable use of natural resources and ecosystems**

This program will demonstrate the economic value of good management by redirecting the use of natural systems and resources so that their conservation and continued use are assured. There are four components.

**1. Afforestation.** This project will generate information for sustainable forest production that can be processed to the advantage of both the producer and the country. The project has been financed by National Pre-investment Fund which is supported by the Inter-American Development Bank and is being executed by the Forestry Directorate of Ministry of Livestock, Agriculture and Fisheries with the technical cooperation of the Department of Regional Development and Environment of the General Secretariat of the Organization of American States.

**2. Valuation of the Natural Services Provided by Forests.** The project will investigate the genetic, productive, and protective properties of native forest ecosystems and evaluate their potential uses. The gallery and mountain forest ecosystems of the country are to be studied in terms of their capacity for protecting soils, retaining water, providing habitat for fauna, and sheltering livestock.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Forestry Directorate and the Directorate of Renewable Natural Resources of the Ministry of Livestock, Agriculture and Fisheries; the National Institute of Agricultural Research and the Agronomy and Science Faculties of the University.

Nature of Project: Technical cooperation to design the research program.

Costs and Financing:

Total: US\$ 50,000

External Funding: US\$ 40,000

National Counterpart: US\$ 10,000

**3. Sustained Livestock Production on Natural Pastures.** This project will restore and improve conditions of the natural pastures, increase their natural vegetative cover and capacity to retain soil and water, as well as to increase livestock production. Supporting research on natural ecosystems and on technologies for sustainable production are required. The project has two components. The first deals with the generation and transfer of technology and the second is to define the pilot level production systems for implementation and monitoring in representative natural pastures.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Ministry of Livestock, Agriculture and Fisheries, INIA and its field stations as well as the Agronomy Faculty of the University.

Nature of Project: Technical cooperation to investigate and implement projects for sustainable livestock development.

Costs and Financing:

Total: US\$ 127,000

External Funding: US\$ 105,000

National Counterpart: US\$ 22,000

**4. Land-use Zoning.** This project provide technical assistance for land-use zoning in order to make the best economic use of available lands and technology. This will constitute the basis for directing sustainable development on a national scale. Information will be gathered which describes natural formations, resources and actual land-use. Terms of reference will be written to cover the project



activities, its implementation and financing.

Coordinating Institution: MVOTMA/DINAMA/ National Land-use Zoning Directorate (DINAOT).

Executing Agencies: Same.

Nature of Project: Technical Cooperation for Institutional Strengthening.

Costs and Financing:

Total: US\$ 50,000

External Funding: US\$ 40,000

National Counterpart: US\$ 10,000

## Program 7: Energy for sustainable development

The program seeks to support use of environmentally benign energy resources (i.e. wind), and greater energy saving through new technologies for home heating including low-cost housing projects.

**1. Wind-power Farm Project.** The project is a pilot feasibility study for the first electric energy producing wind-power farm in Uruguay. Information based on research and existing technology developed in national institutions will be used.

Coordinating Institution: National Energy Directorate.

Executing Agencies: State Telephone and Energy, Engineering Faculty, National Directorate of Meteorology.

Nature of Project: Pre-feasibility study.

Costs and Financing:

Total: US\$ 60,000

External Funding: US\$ 50,000

National Counterpart: US\$ 10,000

**2. Household Energy Conservation.** This project will: a) study the savings from incorporating new technologies for cooking and heating; and b) design a research project to investigate heating for low-cost housing. The home energy savings component requires a consultant to design an financing and investment project to substitute high energy use equipment in homes. The second component will use consultants to undertake integrated research of the "comfort zone" in low-income housing and will require expertise in the use of solar energy, construction materials, residual heating and project evaluation on an economic level.

Coordinating Institution: MVOTMA/DINAMA/ National Directorate of Housing.

Executing Agencies: National Energy Directorate, Institute of Building Construction of the Architecture Faculty.

Nature of Project: Technical cooperation.

Costs and Financing:

Total: US\$ 55,000

External Funding: US\$ 43,000

National Counterpart: US\$ 12,000

## Program 8: Environmental education

The proposed program is based on two complementary projects geared to: i) inspire mature, responsible attitudes regarding sustainable development and the carrying capacity of ecosystems and natural resources; and, ii) provide incentives for responsible, ethical, and impartial behavior. The projects will address the formal education sector and the development of non-formal mechanisms of education and organized social participation.

### **1. Environmental Education Projects of the National Administration of Public Education (NAPE).**

This project is strategic in nature, and aims to update teacher training and curriculum design to give new generations the capacity to act in a responsible manner vis-a-vis the natural surroundings. It consists of five sub-projects:

- Training, curricula integration, and application of methods for teachers and professors of intermediate and technical
- Curricula integration and training of normal school teachers;
- Design training and informational materials;
- Design and strengthen experimental microprograms; and,
- Adding the environmental dimension to the curricula of agricultural schools.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: CODICEN, through the specialized organizations of the National Public Education Administration and the Vocational University of Uruguay.

Nature of Project: Technical cooperation and Institution Building.

### Costs and Financing:

Total: US\$ 292,000

External Funding: US\$ 234,000

National Counterpart: US\$ 58,000

**2. Informal Environmental Education.** Through use of mass media; organized promotion; and informed, and responsible, social participation, the informal environmental educational project will supplement the formal environmental education project and compliment all other projects of the EAP. The project is to instill new social values in the citizens of Uruguay for the conservation of nature. Citizen participation will assume roles that the state cannot take on. Personnel will be trained to carry out informal education for the conservation of nature and improvement of environmental quality; promotion of scientific research; and, social promotion for the management of protected wild areas. The project has been designed at the level of pre-feasibility. It is estimated that the project would be completed in a period of 15 months.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Ministry of Education and Culture and Environmental and Developmental NGOs.

Nature of Project: Technical cooperation.

Costs and Financing:

Total US\$ 102,000

External Funding: US\$ 80,000

National Counterpart: US\$ 22,000

**3. Environmental Sciences Institute.** Technical cooperation Is being sought through a proposal prepared by the School of Sciences of the University of the Republic. It is to be applied to the Santa Lucia River Basin and is to provide academic training in the environmental sciences.

## Program 9: Support of economic policy and environmental management

This program will generate a System of Environmental Accounts that will supplement the current system of National Accounts and the Natural Resources Accounting System.

**1. Establishment of a National System of Environmental Accounts.** A Uruguayan system of environmental accounting would be an important asset for understanding the country's environmental problems and policies. The purpose of this project is to delineate the main components of a Uruguayan system of environmental accounting. The components were suggested according to their importance to both economics and environmental management and because the requisite information was available. Technical cooperation will be required to design the study.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Ministry of Livestock, Agriculture and Fisheries, Ministry of Economy and Finances, Office of Planning and Budget, Central Bank of Uruguay.

Nature of Project: Technical cooperation.

Costs and Financing:

Total US\$ 40,000

External Funding: US\$ 30,000

National Counterpart: US\$ 10,000

**2. System of Natural Resource Accounts.** The objective of this project is to create instruments for the analysis of information on soil, water, and natural vegetation that will allow development of sustainable development policies for Uruguay. It will also supplement the current National Accounts System with real data on how the Nation's renewable natural resources are used. In earlier work undertaken by EAN in cooperation with the National Soils and Water Directorate of Ministry of Livestock, Agriculture and Fisheries, a pre-feasibility level study was designed which is considered to be the first step toward creating a national system of environmental accounts. It is estimated that six months will be required to

fully execute the project once it is initiated.

Coordinating Institution: MVOTMA/DINAMA.

Executing Agencies: Ministry of Livestock, Agriculture and Fisheries/National Soils and Water Directorate.

Nature of Project: Technical cooperation.

Costs and Financing:

Total US\$ 234,000

External Funding: US\$ 167,000

National Counterpart: US\$ 67,000

## Implementation

**Institutional Arrangements:** Execution of the EAP will depend on the structure and mandate of each executing agency. For example, the MVOTMA is responsible for EAP coordination, management, and follow-up.

The creation of a political authority for the execution of the EAP within MVOTMA will permit national policy to reflect environmental concerns. This authority takes the form of a commission or upper-echelon, inter-institutional group of national institutions that participate in the EAP.

The implementing agencies (see Figure 6) are government institutions that have been assigned responsibility for the various projects. Because of their responsibilities and scope of participation, the Ministry of Livestock, Agriculture, and Fisheries; the National Administration of Public Education; the National Administration of Sanitation Works, and the interested municipal governments will play major roles. Likewise, the participation of the Office of Planning and Budget, the Ministry of Economy and Finances, and the Ministry of Foreign Affairs will be important. According to the EAP, the following institutions have specific responsibilities: Ministry of Transportation and Public Works, Ministry of National Defense, Ministry of Public Health, Ministry of Education and Culture, Ministry of Tourism, Ministry of Industry, Energy, and Mines, University of the Republic, National Institute of Agricultural Research, and the Technological Laboratory of Uruguay.

**Costs and Financing:** The EAP contains programs and projects that require outside technical and financial cooperation. Therefore, acquisition of international funding to support these efforts at environmental management is a priority.

Costs of the EAP for studies, research and institutional reform amount to approximately US\$ 4,100,000, to be covered from international sources of financing and technical cooperation. A national counterpart contribution of nearly US\$ 970,000 is expected.

A further US\$ 1,200,000 in external funds are required for financing pre-investment studies. Nearly US\$ 280,000 will be supplied by Uruguay for these purposes.

Approximately US\$ 20,000,000 will be needed to execute the investment projects that are to be formulated. Nearly US\$ 2,000,000 of this amount will come from national funding.

Several stages of implementation of the EAP have been contemplated. To reach the final goal of sustainable development that this plan offers will require three years for start up, project studies, and project execution.

***Figure 6. Institutional proposal for a national environmental management system***

**THE ORGANIZATION OF AMERICAN STATES**

The Organization of American States (OAS) is the world's oldest regional organization, dating back to the First International Conference of American States, held in Washington, D.C., on April 14, 1890. This meeting approved the establishment of the International Union of American Republics. The Charter of the OAS was signed in Bogota in 1948 and entered into force on December 13, 1951. The Charter was subsequently amended by the Protocol of Buenos Aires signed in 1967, which entered into force on February 27, 1970, and by the Protocol of Cartagena de Indias, signed in 1985, which entered into force on November 16, 1988. The OAS currently has 35 Member States. In addition, the Organization has granted Permanent Observer status to 27 States in Europe, Africa and Asia, as well as to the Holy See and the European Economic Community.

The basic purposes of the OAS are as follows: to strengthen the peace and security of the continent; to promote and consolidate representative democracy, with due respect for the principle of nonintervention; to prevent possible causes of difficulties and to ensure the pacific settlement of disputes that may arise among the Member States; to provide for common action on the part of those States in the event of aggression; to seek the solution of political, juridical and economic problems that may arise among them; to promote, by cooperative action, their economic, social and cultural development, and to achieve an effective limitation of conventional weapons that will make it possible to devote the largest amount of resources to the economic and social development of the Member States,

The OAS accomplishes its purposes through the following organs: the General Assembly; the Meeting of Consultation of Ministers of Foreign Affairs; the Councils (the Permanent Council, the Inter-American Economic and Social Council and the Inter-American Council for Education, Science, and Culture); the Inter-American Juridical Committee, the Inter-American Commission on Human Rights; the General Secretariat; the Specialized Conferences; the Specialized Organizations and other entities established by the General Assembly.

The General Assembly holds regular sessions once a year. Under special circumstances it meets in special session. The Meeting of Consultation is convened to consider urgent matters of common interest and to serve as Organ of Consultation under the Inter-American Treaty of Reciprocal Assistance (Rio Treaty), the main instrument for joint action in the event of aggression. The Permanent Council takes cognizance of such matters as are entrusted by the General Assembly or the Meeting of Consultation and Implements the decisions of both organs when their implementation has not been assigned to any other body, it monitors the maintenance of friendly relations among the Member States and the observance of the standards governing General Secretariat operations and also acts provisionally as Organ of Consultation under the Rio Treaty. The purpose of the other two Councils is to promote cooperation among the Member States in their respective areas of competence. These Councils hold one annual meeting and meet in special sessions when convoked in accordance with the procedures provided for in the Charter. The General Secretariat is the central and permanent organ of the OAS. The headquarters of both the Permanent Council and the General Secretariat is in Washington, D.C.

**MEMBER STATES:** Antigua and Barbuda, Argentina, The Bahamas (*Commonwealth of*), Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica (*Commonwealth of*), Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States, Uruguay and Venezuela.

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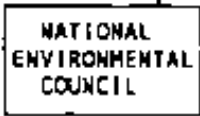


ENVIRONMENTAL POLICY  
COORDINATION

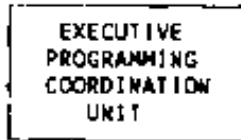
INSTITUTION  
OF THE SYSTEM



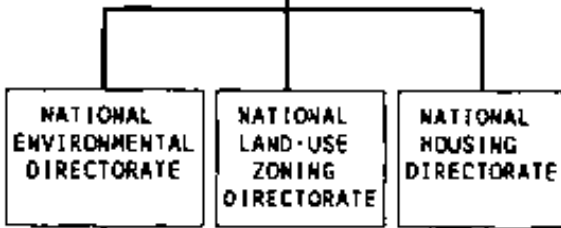
POLICY LEVEL



PLANNING PROGRAMMING  
& COORDINATION LEVEL



FIELD CONTROL  
& COORDINATION  
UNIT



ENVIRONMENTAL  
QUALITY CONTROL

