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A Partnership for Environmental Progress

The World Bank in Latin America and the Caribbean

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The World Bank
Washington, DC
September 1994

A Partnership for Environmental Progress

Addendum to Annex 1

Three additional Bank projects with environmental components in Latin America and the Caribbean (LAC) were presented to the Board of Directors in June 1994. The information presented below on these projects supplements the data given in Annex 1. This brings the number of Bank projects with environmental components in LAC for fiscal 1994 to nineteen, with commitments of about $2.2 billion.

Annex 1: Projects with environmental components, fiscal 1994

Country	Project	EA cat.[1]	Total cost (US$)[2]	Loan/ cred. amt. (US$)[2]	Maj/ min. env. comp.	Environmental component
Mexico	Northern Border Environment Project (Ln. 3750-ME)	A	762.0	368.0	Major	Institutional Strengthening and Hazardous Waste Management Environmental Services Improvement
	Second Water Supply and Sanitation Sector (Ln. 3751-ME)	B	700.0	350.0	Minor	Strengthening Federal Agencies Investment Support to Local Water Utilities (WUs) Institutional Support to WUs
	Solid Waste Management II (Ln. 3752-ME)	A	500.0	200.0	Major	Institutional Strengthening Investment Support for Implementation of Integrated Solid Waste Management Plans Social Component for Scavengers

1. Environment categories (A, B, or C) are assigned according to guidance provided in the Bank's Operational Directive 4.01 *Environmental Assessment.*

2. Total costs and loan/credit amounts are given in millions of US dollars.

Corrigendum to Annex 4

The title of Annex 4 should be revised as indicated below. The original table includes Montreal Protocol projects, not GEF projects. Listed below are the GEF projects which also should be included in Annex 4.

Annex 4: Montreal Protocol and GEF Projects Implemented by the World Bank *(approved as of June 30, 1994)*

Country	FY	Grant Amount ($ millions)	Main project	Subprojects
Mexico	92	25.0	Protected Areas Program	Protected Areas Management; Ecotourism
Bolivia	93	4.5	Biodiversity Conservation	Protected Areas Management; Buffer Zone Management
Costa Rica	94	3.3	Tejona Wind Power	Fossil Fuel Displacement; Wind Turbine Installation
Ecuador	94	7.2	Biodiversity Protection	Park Management; Institutional Strengthening; Training
Jamaica	94	3.8	Demand Side Management Demonstration	Support for an Integrated Approach to Energy Conservation
Mexico	94	10.0	High Efficiency Lighting Pilot	Support for Fluorescent Light Bulbs; Institutional Strengthening
Wider Caribbean	94	5.5	Wider Caribbean Initiative for Ship-Generated Waste	Support for Ratification and Implementation of MARPOL 73/78 Convention to Reduce Discharge of Ship-Generated Waste

A Partnership for Environmental Progress

The World Bank
in
Latin America and the Caribbean

September 1994
Latin America and the Caribbean Region
The World Bank

This report was prepared by William Partridge, Dan Biller, David Greene, George Ledec, Andrés Liebenthal, Bekir Onursal, Juan David Quintero, and Teresa Serra, under the general supervision of Dennis Mahar.

Many people in the Bank's vice presidency for Latin America and the Caribbean provided helpful comments and contributions. General assistance was provided by Carmen Hess, Laura Alvarez, John Milan Gross and Carlos Basañes. The report was edited by Charlotte Maxey, and the desktopping and cover design were produced by Peter Brandriss.

Photos:

Cover	Blast furnace, Mexico. John Cleave. Women and children, Guatemala. Curt Carnemark. Festive Parrot (*Amazona festiva*), Brazil. Nigel Smith.
Page 3	Washing laundry in river, Mexico. John Cleave.
Page 10	Cascading stream, Chile. Curt Carnemark.
Page 28	Resettled village, Zimapán hydroelectric project, Mexico. John Cleave.
Page 44	Digging trench for water supply pipe, Guatemala. Curt Carnemark.
Page 51	Coking plant, Mexico. John Cleave.

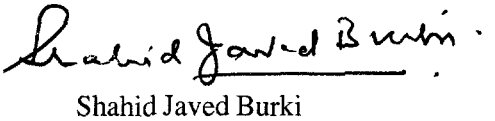
Foreword

Sustainable economic development is inseparable from wise management of natural resources. In the countries of Latin America and the Caribbean, debt and adjustment concerns that dominated the policy agenda only a few years ago have been superseded by the concerns of improving physical infrastructure, developing human resources, enhancing the participation of citizens in development, and protecting the environment.

The World Bank has integrated the environmental aspects of economic development into its core business of lending and providing policy advice. Environmental projects now represent about one-quarter of all Bank loans and credits in the region. Over the next three years these operations are expected to increase to more than one-third.

This paper describes some of the environmental issues faced by the countries of the region and many of the bold initiatives countries are taking to address them. It also illustrates World Bank efforts in assisting member countries as they accept the challenge of improving the environmental conditions of their people.

The World Bank will remain a partner in the continuing effort to manage environmental resources to sustain economic development in Latin America and the Caribbean.



Shahid Javed Burki
Vice President
Latin America and the Caribbean Region

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(continued)

Boxes

Abbreviations and acronyms

CDB	Caribbean Development Bank
EA	Environmental Assessment
EBY	Yacyretá Binational Entity
ECLAC	Economic Commission for Latin America and the Caribbean (United Nations)
EIB	European Investment Bank
ESW	Economic and sector work
G-7	Group of Seven (countries)
GEF	Global Environment Facility
GIS	Geographical Information System
IBAMA	Brazilian Environmental Institute
IBRD	International Bank for Reconstruction and Development (World Bank)
IDA	International Development Association
IDB	Inter-American Development Bank
IDF	Institutional Development Fund of the World Bank
IFAD	International Fund for Agricultural Development
ILO	International Labour Office
LAC	Latin America and the Caribbean Regional Office (World Bank)
MBI	Market-based incentives
MEIP	Metropolitan Environment Improvement Programme
NAFTA	North America Free Trade Agreement
NEAP	National environmental action plan
NGO	Nongovernmental organization
OD	Operational Directive
OECS	Organization of Eastern Caribbean States
OMS	Operational Manual Statement
OP	Operational Policy
OPN	Operational Policy Note
PAHO	Pan American Health Organization
SEA	Sectoral environmental assessment
UNDP	United Nations Development Programme
UNHCS	United Nations Center for Human Settlements
WC	Wider Caribbean

Definitions of selected terms

Reform or *restructuring*—Increases sectoral efficiency and productivity, yielding environmental benefits in the form of waste reduction and resource conservation.

Policy or *regulatory reform*—Reduces policy-related environmental problems and enhances the legal capacity of government to monitor and control environmental externalities.

Externalities—Activities by one or more individual(s) that cause an uncompensated loss (or gain) of welfare to another individual(s); for example an upstream industry that discharges waste into a river causing a decline in the fishing stock downstream.

Institutional strengthening—Increases the administrative capacity of *existing* agencies and organizations to provide services, implement policies and enforce regulations affecting the environment.

Institutional development—Creates *new* agencies or organizations to provide services, implement policies, and enforce regulations affecting the environment.

Urban environmental management—Addresses problems of urban environmental degradation: water supply, sanitation and drainage; solid and hazardous waste management; motor vehicle and industrial emissions; and flooding, landslides, and earthquakes.

Land titling and registration—Grants secure ownership of land to private holders and can improve resource management and reduce environmental degradation.

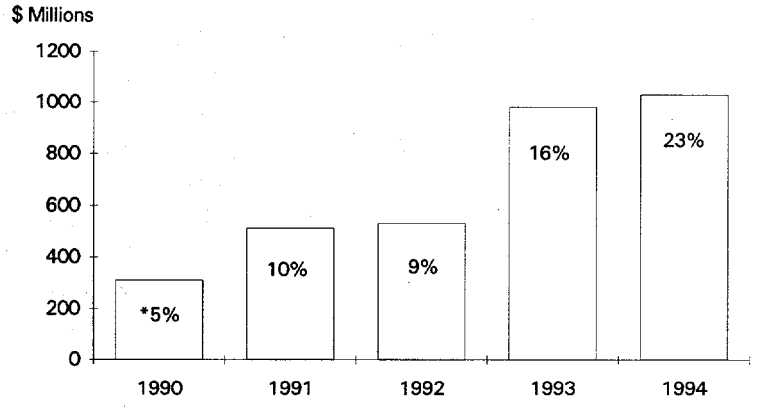
A partnership for environmental progress: The World Bank in Latin America and the Caribbean

World Bank activities in support of borrower environmental stewardship has increased rapidly over the last few years.[1] Lending specifically targeted to the environment has risen by a factor of five between 1987 and 1994. Twenty-five new primarily environmental projects were approved in fiscal 1994, raising the Bank's active environmental portfolio to about $9 billion[2] in loans and credits for 118 projects worldwide. More than thirty other projects approved in fiscal 1994 had significant environmental components. A majority of developing countries now have completed National Environmental Action Plans (NEAPs) or equivalent documents and are beginning to implement them, in many cases with Bank support. Clearer environmental goals have also led to greater cooperation between countries as they recognize common priorities and seek to address them through regional strategies supported by the Bank. New policies for managing forests and water resources are being put into practice. Technical assistance and analytical work have expanded to meet increased demand from member countries to improve policy, project design and implementation.

During the 1994 fiscal year, about one-quarter of IBRD/IDA[3] operations in the Latin America and Caribbean region were environmental projects or projects with significant environmental components (see annex 1). This share has been increasing steadily over the last several fiscal years (see annex 2). In some parts of the region, however, the proportion is much higher, such as in Mexico and Central America where 76 percent of total commitments in fiscal 1994 had environmental focus.

The environmental work of the World Bank falls into four general categories: assisting countries in environmental stewardship, addressing environmental impacts of projects, building on the synergies between poverty alleviation, economic efficiency and the environment, and supporting work on global environmental challenges. This report on Bank environmental work in Latin America and the Caribbean provides a current overview of the environmental challenges in the region and describes the growing partnership in each of these four areas in recent years.

Lending for environmental projects in Latin America and the Caribbean, fiscal 1990-94



* Percentage of total World Bank lending in the region.

Meeting the environmental challenges in Latin America and the Caribbean

During most of the 1980s, governments in Latin America and the Caribbean were preoccupied with the enormous stresses associated with structural adjustment, and environmental concerns were pushed off center stage. However, over the last several years there has been a growing awareness among governments and the public that environmentally sound natural resource management is not just a luxury (that only industrial countries can afford) but is a necessity for successful long-term development. It is also an important tool for improving the well-being of the populace. With increasing knowledge about the consequences of environmental degradation for human health, as well as for productivity and growth, and with democratization empowering people who experience the worst consequences of environmental degradation in their everyday lives, countries in Latin America and the Caribbean have been intensifying their efforts to protect their natural resources and decrease the threats to human health from air and water pollution. These efforts are manifest in increasing attention to urban and rural environmental issues and new environmental legislation for strengthening the legal and regulatory framework that deal with these issues. The governments of the region are also taking actions to exercise their responsibility for stewardship of their large and unique stock of plant and animal species.

Box 1. The urban environmental challenge in the 1990s: Government, markets, and the public

The cities and towns of Latin America are the human-made environment in which nearly three-quarters of the population of the region live and work. Providing services to these urban areas that are both sustainable and accessible to all segments of society means overcoming increasingly complex and interdependent problems. As a result, the Bank has been called on to augment its traditional urban development agenda with a new set of environmental concerns and to redefine both its analysis and implementation of urban development projects accordingly. A World Bank–sponsored, two-day conference in Quito, Ecuador in June 1993, sought to address this challenge. Senior professionals from government agencies, nongovernmental organizations (NGOs), and multilateral development organizations were brought together to share their practical experiences, good and bad, in dealing with urban environmental degradation. Nearly sixty officials attended, many from the agencies of the larger Latin American metropolitan areas such as Mexico City, São Paulo, Buenos Aires and Bogotá. Representatives of NGOs such as IBAM (Brazil), CEDACEL (Chile), UCCI (Argentina), Bogotá Siglo XXI (Colombia), and FUPROVI (Costa Rica) participated as speakers and session coordinators. The sessions were also attended by the Inter-American Development Bank (IDB), the United Nations Development Programme (UNDP), and the World Resources Institute (WRI), as well as World Bank staff. Thirty presentations, including sixteen case studies, were presented about cities in the region.

Two themes dominated the discussions: (a) creating responsive environmental institutions and (b) finding appropriate combinations of regulatory and market-based approaches to pollution control. Participants were invited to discuss their

The nature and causes of environmental problems

The rapid industrialization and urbanization of the Latin America and Caribbean region, combined with population growth and persistent poverty, have generated complex environmental issues (see box 1). Industry and transport have grown in a rapid, largely uncontrolled manner, and infrastructure for supplying clean water and disposing of liquid and solid wastes has not kept pace. As a result, air and water pollution as well as hazardous wastes pose threats to human health. At the same time, strong pressure to further develop natural resources to meet an increasing demand for food, fuel and industrial inputs has resulted in environmentally unsound exploitation of resources. Finally, the persistence of poverty has pushed people out into the open frontiers seeking a better life, but the intrusion places severe environmental pressure on the forests and soils in these areas.

perceptions of the most critical urban environmental issues and to identify priorities for local governments in the coming years. Presentations were made on the role of government as coordinator in policy setting and provision of services, public participation in metropolitan planning, enhanced accountability and responsiveness of government to the public interest, and the regulatory framework and incentive mechanisms that can be used to improve specific urban services.

The discussions revealed broad agreement on urban environmental priorities. Expanding access to potable water was held to be a proven, cost-effective way of improving the health of city dwellers. Provision of sewerage, it was agreed, falls far short of requirements, and broadening coverage would improve the environment and improve health levels, while creating opportunities for private enterprise. Toxic and hazardous wastes are not yet viewed as a critical problem in many of the region's cities, although they could be a very important issue in the near future. Future costs could therefore be mitigated by establishing policies, regulations and monitoring systems now.

Many participants considered weak institutions and political organizations a critical constraint. Instances of interjurisdictional and intersectoral cooperation have demonstrated the value of local institutions as a critical resource for environmental improvement. In this process, public participation in policy setting, program design and implementation is vital. Governments, NGOs, community groups, academicians and the media still need to find more effective ways of working together. Comprehensive analytical frameworks and urban development strategies should be the base for building specific sectoral or site-specific programs. This would provide consistency between initiatives implemented by decentralized agents (public or private). Finally, the environment should not be dealt with as a specific sector, as an end in itself that can dominate the urban agenda but rather as a factor in good public management and sustainable economic development.

Environmental degradation in Latin America and the Caribbean is of special concern not only because of its direct adverse effects on human well-being and the negative implications for future development but also because the region has high geographical, biological and cultural diversity. The Amazon region alone is estimated to have more than 5,000 species of plants, 950 bird species, 300 reptile species and a similar number of amphibians, between 2,000 and 3,000 species of fish, and possibly millions of insect species. Biodiversity in the region is among the greatest on earth, but several areas are under severe threat, especially in the Atlantic coastal forest of Brazil, the Tropical Andes, and the dry Pacific slope forests of Central America. Sociocultural diversity is also great, as indicated by the more than 450 indigenous languages spoken by indigenous peoples, in addition to Spanish, Portuguese, English, French and Dutch.

A growing environmental partnership

Collaboration between the Bank and countries in the Latin America and Caribbean region on environmental matters is increasing and maturing. It follows the important shift under way in Bank environmental work from emphasis on the design of projects and codification of Bank policies to supporting their implementation on the ground. Stronger emphasis is therefore being given to work that will help countries carry out projects successfully, such as developing the institutional capacity for environmental management, incorporating environmental concerns into analytical work, and identifying the social aspects of environmentally sustainable development.

The Bank is working with many governments in Latin America and the Caribbean to incorporate environmental considerations into mainstream development planning through both sectoral policies (such as in agriculture, forestry, water, electric power, industry and transportation) and specific investment projects, many of which are targeted toward existing pollution or natural resource degradation. The Bank continues to promote environmental assessment (EA) as a cost-effective means of preventing serious impacts on humans and the environment. The Bank also supports government efforts through analytical work on a wide range of environmental issues to encourage needed policy changes and strengthening of key institutions and to provide technical expertise for carrying out specific environmental investments.

Within this framework, there are three major types of Bank lending specifically targeted to the environment: urban and industrial pollution control (the "brown" agenda), improved natural resource management ("green"), and environmental institution building. The Bank also provides support for preparing and implementing national environmental plans and strategies and for addressing social issues (discussed in the third section below).

Even a brief overview of projects in the brown agenda shows the wide range of issues now being addressed by governments in Latin America and the Caribbean, often with the assistance and support of the Bank. Because of pressing urban environmental problems in many of the countries, the Bank supports several water and sanitation projects (for example, in Argentina, Brazil, Colombia, Guyana and Paraguay). Industrial pollution control projects for reducing the amount of polluting substances discharged

into air, water and soils are also under way. Two industrial pollution control projects in Brazil are designed to improve environmental conditions generally in urban areas. Emissions from motor vehicles are a major cause of air pollution in Latin America and the Caribbean. Urban transport projects designed to reduce emissions are therefore under way in São Paulo, Caracas, and several urban centers in Mexico, including the border cities (see box 2). Hazardous waste remediation is another growing and important element in the environmental portfolio. In fiscal 1994, both Argentina and Jamaica began projects with components for remediation of this kind.

Improved management of land and forest resources continues to be a major focus of Bank cooperation with Latin America and Caribbean countries. An Agricultural Sector Credit in Honduras has been designed to support new policies and procedures for sustainable resource use. Land and forest conservation is being promoted by encouraging more secure land tenure arrangements and conserving biodiversity by improving management of forests and protected areas. The Trinidad and Tobago Forestry and Natural Resources Management Project helped establish a Ministry of Environmental Management, mapped out areas for the conservation of biodiversity, funded

Box 2. Mexico Transport Air Quality Management Project

A $220-million loan to Mexico supports a comprehensive program to reduce air pollution from vehicles in Mexico City's metropolitan area. By improving air quality, the program is intended to reduce morbidity and premature death due to respiratory and cardiovascular illness, reduce time lost from work, and improve the overall well-being and quality of life of the city dwellers. The project has five components:

- The vehicles component includes support for developing and enforcing emissions standards; progressive improvements in emission standards; credit to finance the replacement of older, high-use vehicles; and a better vehicle registration system.
- The fuel component helps fund the installation of vapor recovery systems at service stations and a pilot alternative fuel program for vehicle conversion.
- The transport policy and management component includes the preparation and integration of a transport and air quality management strategy.
- The scientific component helps fund consultant services for strengthening air quality planning through an integrated research plan and the purchase of equipment for extending the air quality monitoring system.
- The institutional strengthening component assists technical support teams and agencies responsible for controlling air pollution and finances an independent environmental audit of public agencies and private organizations.

upland reforestation, and provided for better management of logged areas and coasts. Natural resource management projects in Paraguay and Uruguay focus on reducing soil degradation in agricultural areas, protecting areas of high biodiversity, and promoting environmental research. In Paraguay special attention has been given to more secure land tenure for indigenous people.

Strengthening key environmental agencies and sectoral agencies with environmental responsibilities and fortifying the regulatory framework have been the objectives of several technical assistance loans (for example, to Argentina, Bolivia, Chile, Colombia, Ecuador, and Peru) and loans with sizable environmental components (for example, the Espírito Santo Water Management and Pollution Control and the State Highway Management II projects in Brazil and the Urban Transport Project in Venezuela). Technical assistance projects help countries reap the substantial economic and social rewards from investments in the environment. A valuable side benefit from these efforts is the skill and experience gained as more environmental projects and components come under implementation and the Bank and policymakers learn better the obstacles to sustainable development and how to overcome them.

The Bank has increased its emphasis on economic and sector analyses devoted to environmental issues, including studies of mining, integrated pollution management, natural resources management, transportation, and forestry. For example, an evaluation of environmental issues in Mexico includes new initiatives in water and air pollution, solid and toxic wastes, decentralization and institutional development, and protection of natural resources and biodiversity. Other studies examine frontier agriculture in

Box 3. Chile: Quantification of environmental costs and benefits

A recent study, "Chile: Managing Environmental Problems," illustrates the application of economic analysis to both green and brown issues. The study has three objectives: (a) to estimate the health benefits of air pollution control in Santiago and to quantify the links between reduction of emissions, improvements in air quality, and a reduction in the incidence of respiratory diseases; (b) to provide evidence of epidemiological links between water pollution and morbidity, valuate the health outcomes, estimate the costs of various interventions to improve water quality, and recommend a new regulatory framework in the light of these costs and benefits; and (c) to review the management options for native forests (including comparisons of plantations and mixed-species forests), assess biodiversity in forest areas, and identify the economic and social benefits of native and exotic forests.

the Amazon Basin; urban pollution in Chile, Mexico and Brazil; and management options for native forests in Chile (see box 3).

The Environment Unit for the Latin America and Caribbean Region in the Bank also produces a series of informal, technical "Dissemination Notes." Over the past year, ten notes were issued covering a range of topics from "The Urban Environmental Challenge in Latin America" to "Prospects for Improved Management of Natural Forests in Latin America" and "Pueblos Indigenas y Desarrollo" (Indigenous Peoples and Development). (See annex 3 for a list of other publications produced by the unit.)

Supporting environmental stewardship

World Bank support for improved environmental management in Latin America and the Caribbean involves three major areas of emphasis. First, the Bank is promoting increased environmental investment in urban areas, where over 70 percent of the population of Latin America and the Caribbean lives. Many Bank-supported projects address serious, long-neglected urban environmental problems, including air and water pollution and solid and hazardous wastes management. Second, the Bank is continuing to support improved natural resource management in rural areas, where deforestation, land degradation, mismanagement of water resources, and loss of biodiversity are major issues. Third, the Bank is emphasizing social concerns that have received inadequate attention in the past. These include improving the way resettlement is carried out, tailoring selected development and resource management activities to the needs of indigenous peoples, and increasing public participation in the planning of development projects. Although these social issues transcend environmental assessment, they are discussed in the next section on addressing the impacts of projects.

Protecting the urban environment

Environmental problems in urban centers of Latin America and the Caribbean impede the development process through increased costs to

human health and restricted productivity growth. Urban environmental degradation results from a range of sources, collectively termed the "brown agenda," which includes air, water and soil pollution from domestic and industrial sources, automotive emissions, water resource and land degradation, and increased risk from environmental hazards. The most critical forms of environmental degradation in the region's large cities are pollution-related—involving impacts on respiratory health due to poor air quality, and increased rates of diarrhea and waterborne disease due to inadequate water supply and sanitation services. The extent of these problems has intensified due to the rapid rate of growth in some cities. Between 1970 and 1990, while the total urban population of the region doubled, the population in large cities (those over 1 million) increased by a factor of two and a half.

Bank-supported urban water pollution projects seek to improve and maintain water quality, achieve financial and administrative reforms and autonomy in the agencies that deliver sanitation services and, where appropriate, create or consolidate local river basin authorities. The Water Quality and Pollution Control Project in Brazil is designed to recuperate the environmentally deteriorated urban basins of the Guarapiranga River in the State of São Paulo and the Alto Iguaçú River in the State of Paraná. Through this project, residents of São Paulo and Curitiba will receive water supply, sewerage, and solid waste collection and disposal services, along with the benefits of urban rehabilitation and flood control measures. In addition, institutional strengthening directed at environmental protection and water basin management will generate long-run benefits for a substantial portion of the 14 million residents of the two metropolitan areas. A sister project in the neighboring state of Minas Gerais is designed to improve the water quality of the Arrudas and da Onça river basins, directly benefiting an estimated 1.3 million inhabitants of the Belo Horizonte metropolitan area. This project addresses rehabilitation and expansion of basic sanitation infrastructure and strengthening of institutional capabilities to manage the water basin in an environmentally sustainable way. Both of these projects are innovative in adopting a river basin approach to urban water resource planning and pollution abatement. They also emphasize the importance of appropriate water tariffs as a means of not only achieving cost recovery but also of signaling to consumers the real cost of an increasingly scarce resource.

Projects for improving urban air quality seek to reduce harmful emissions of such pollutants as suspended particulates, nitrous oxides, sulfur oxides and lead. These projects involve loans for pollution control investments, lines of credit to industries investing in anti-pollution equipment, and measures for strengthening the institutional, regulatory and management capabilities of environmental protection agencies. Mobile sources are the most important source of air pollution in many urban centers. The Mexico Transport Air Quality Management Project addresses the challenge of the severe and complex air pollution problems in Mexico City's metropolitan area (see box 2). The National Industrial Pollution Control Project is financing investments in existing industrial facilities in Brazil to control all types of industrial pollution—air, water, and hazardous waste. This project grew directly out of the Bank's earlier successful assistance in pollution control to the State of São Paulo and the desire of various industrialized Brazilian states to follow this example. Through the funds provided, participating states are establishing integrated pollution control strategies to be reviewed and approved by the Bank.

The Bank is beginning to address environmental problems in the region's medium-size cities as well. Rapidly industrializing urban areas of fewer than 1 million inhabitants are subject to the most severe forms of environmental degradation as they simultaneously attempt to cope with an expanding population, insufficient public infrastructure, and inadequate environmental regulatory capacity. The Northern Border Environment Project is the largest and most comprehensive initiative supported by the Bank to address interlinked urban environmental problems. The project will provide hazardous waste management, protection of biodiversity, water supply and sanitation, solid waste collection and disposal, and urban transport emissions control. Investments are targeted at improving the provision of environmental services in participating cities on the Mexico-U.S. border and funding technical assistance and related activities to strengthen the institutional capabilities of federal, state and municipal authorities for effective environmental management.

It is estimated that in 1988 the 300 million urban inhabitants in Latin America and the Caribbean generated 225,000 tons of solid waste daily (18 percent of which was never collected), amounting to nearly 1.5 billion tons of garbage per year. Uncontrolled disposal of urban waste into water bodies, open dumps, and wetlands is a principal cause of surface and groundwater pollution from contaminated liquids that percolate into the soil.

The Second Solid Waste Management Project in Mexico builds directly on the Bank's experience in the earlier pilot project, which is reflected in the more comprehensive approach to the problems of the sector. The project provides funding for investments in participating cities through implementation of integrated solid waste management plans and supports institutional strengthening of key agencies at the federal, local and regional levels. An innovative social component of the project provides vocational training and basic infrastructure to scavengers whose livelihoods depend on the dumps that will be closed or upgraded to sanitary landfills.

Managing and protecting natural resources

The principal "green" environmental problems in Latin America and the Caribbean include deforestation, land degradation, loss of biodiversity, improper use of water resources, and mismanagement of fisheries. Many of these problems are related to new settlement in environmentally sensitive frontier areas; others are the result of natural resource mismanagement in long-settled regions. Although considerable progress has been made on some fronts, environmental conditions continue to deteriorate in most countries.

Despite high rates of urbanization, many Latin America and Caribbean countries are still experiencing substantial new human settlement of forested frontier areas. These areas are undergoing rapid deforestation, typically resulting in land uses such as cattle pasture that generate little long-term employment and that may be unsustainable. Frontier settlement often exacerbates rural public health problems such as malaria and social conflicts (especially between settlers and indigenous peoples) over land use rights.

World Bank lending for natural resources management has supported land use planning and zoning projects that seek to provide a rational, technical basis for planning government investments (such as roads, credit and other services) in environmentally suitable areas, while avoiding ecologically sensitive areas designated for conservation. Land titling projects seek to promote natural resource management by increasing land tenure security. Finally, natural resource management projects combine different types of productive and protective components.

Watershed management components of hydroelectric and water supply projects that protect the natural vegetation of upper watersheds can be very cost-effective by increasing the productivity and longevity of

downstream infrastructure. In the St. Lucia Water Supply Project, for example, the reservoir construction involved inundating about 25 hectares in the Roseau River Basin in the interior of St. Lucia, with an area of extreme topography, heavy forest cover and high rainfall. Protection included the acquisition of 70 hectares of private land and resettlement of forty-two families, enhancement of forest cover, and the vesting of 1,500 hectares of forest reserve with the water authority. The protected area not only ensured the reliability and quality of water for urban supplies but also increased the protected habitat for the endangered St. Lucia Parrot (*Amazona versicolor*).

As cities in the Latin America and Caribbean region expand, urban green spaces are increasingly important for public recreation, environmental education, and protection of lands unsuitable for settlement (because of the risk of flooding or landslides). The Rondônia Natural Resources Management Project in Brazil supports the establishment of municipal nature parks in the small and medium cities of Porto Velho, Pimenta Bueno, Ji-Paranã, Ouro Preto do Oeste, and Cacoal.

Extensive local community and farmer participation in the planning and implementation of watershed management activities is a key feature of these projects. Experience in Brazil's Paraná demonstrates the benefits of decentralization in the selection of micro-catchments and the specific interventions to be applied. Other factors contributing to success are that the project grew out of an existing state program (the Integrated Water and Management Program), there was effective coordination at the municipal level, and the private sector was involved, including the provision of on-farm technical assistance.

Biodiversity is of concern to the international community as well as the countries of Latin America and the Caribbean. Biodiversity conservation in Latin America and the Caribbean is especially critical because of the region's high biodiversity endowment and the rapid loss of natural habitats. The benefits of conservation are diverse—including economic, scientific, and aesthetic gains (see box 4). Protection of natural ecosystems for biodiversity conservation often provides other important national and local benefits as well, including increased tourism, ensured water supply, and flood control and other environmental services.

Colombia's Natural Resources Management Project, for one of the richest zones of biodiversity in the region, focuses on the forests of the Choco region of the Pacific coast bordering on Panama. The project is building

Box 4. Assessing the conservation potential and degree of threat to ecoregions in Latin America and the Caribbean: A landscape ecology approach

The scarcity of resources available for biodiversity conservation requires that development agencies and conservation groups invest wisely. In order to incorporate biodiversity considerations more effectively into its portfolio of projects and carry out its role as an implementing organization of the Global Environmental Facility, the World Bank has undertaken a study of the conservation status of terrestrial regions of Latin America and the Caribbean. The World Wildlife Fund (WWF) has been contracted to develop a methodology and take the lead in executing the study. Completion of the study is expected in early 1995.

The objectives of the study are to: (a) define and map terrestrial ecoregions using Geographical Information Systems (GIS); (b) develop an ecologically sound method for assessing the conservation potential of ecoregions and the degree of threat they face; (c) define the conservation status of all terrestrial ecoregions; and thus (d) provide a basis for conservation strategies tailored to each region. The expected benefits include improved decisionmaking processes for major funding agencies; enhanced opportunities for regional specialists to influence the decisionmaking process; and provision of increased information to governments and NGOs in formulating conservation strategies. The study does not establish conservation priorities as this would require incorporation of social, economic and political considerations.

The landscape ecology approach differs from and complements traditional approaches to defining ecoregions, which rely on descriptions of species and numbers of flora and fauna. Instead, this approach considers how much of the ecological region remains intact, the degree of fragmentation, the extent to which natural ecosystem processes are still functioning, the rate of disappearance of the ecosystem and the extent to which it is protected. Based on these factors, indices can be prepared measuring the conservation potential of and degree of threat to ecosystems. These can be used in developing conservation strategies.

Conservation potential is a measure of the probability that original, large-scale ecosystem dynamics can be maintained—independent of rates of habitat loss. It depends on the presence of large unfragmented blocks of habitat, intact watersheds, design of protected area systems, and management of protected areas. Threats are defined as the factors undermining long-term prospects for conservation of biodiversity, including rate of loss or conversion of habitat, fragmentation, degradation, wildlife exploitation, human population density, and long-term development schemes.

The study relies on inputs of regional experts who are uniquely placed to provide data, recognize the dynamics of specific ecoregions, and provide recommendations for addressing threats and gaps in ongoing conservation efforts. Collaboration of individuals, NGOs and government organizations is being actively solicited. All data and digitized maps will be made available to contributors and other interested parties.

capacity for environmental management by increasing the participation of local communities, providing a better information and institutional base for forest management, and protecting watersheds and other environmentally sensitive areas. Land use planning and management systems are also being supported by the Brazil Land Management Project in São Paulo State and the Nicaragua Agricultural Technology and Land Management Project. The Bolivia Land Administration Project goes beyond land administration and management by addressing mechanisms to resolve conflicting land claims (in logging, mining, agriculture, and indigenous territories) and improving cadastral registries and mechanisms for securing land tenure.

Strengthening the institutional framework

Enacting a framework of laws and regulations for environmental protection is an essential first step in the process of conservation. Without sufficiently strong institutions to implement them, however, even the best laws, policies and plans are unlikely to succeed. Thus, countries frequently require financial assistance to build the institutions necessary to put in place, monitor and enforce measures for sustainable development. While many environmental projects in the Latin America and Caribbean region have institution-building components, Bank lending also includes several operations devoted primarily to strengthening institutions at the national level.

Building institutions to provide policy guidance on regulations and to monitor compliance and enforce regulations has proven to be a slow and difficult process, as it usually involves changes in existing institutional structures (see box 5). There are several keys to success, however. For instance, strong institutions usually require well-trained environmental managers who enjoy job security even when governments change. Further, separating the regulatory functions from the enforcement function is generally desirable. It is usually more efficient to decentralize the decisionmaking, monitoring and enforcement tasks as much as possible. The authority to make decisions should be transferred to the local level to make the best use of local knowledge, but efficient decentralization is not easy. Where national institutions are weak, local institutions may be even weaker and may need substantial upgrading. Adequate financial resources for both capital and recurrent expenditures is therefore essential. New environmental agencies also tend to be politically weak, since environmental

policies often take away the right to pollute or to use natural resources from wealthy or powerful people. The agencies consequently tend to be underfunded or dependent on foreign resources. Public awareness and political will are needed to support stable and increased levels of budgetary support.

Governments in Latin America and the Caribbean are strengthening their capabilities for environmental management and regulation, but many still need adequate environmental legislation and regulations. Where there is an adequate legal framework, enforcement generally needs strengthening. In many cases, the responsibilities for environmental management must be more clearly defined. Lack of expertise is still a major constraint for designing and implementing environmental programs in nearly all the countries in the region. Training is needed, along with better employee remuneration to ensure that trained staff remain in key positions.

Institutional strengthening is taking place within a context of widespread privatization, decentralization, and government downsizing in many countries in Latin America and the Caribbean. The Bank is working with governments to ensure that adequate capacity exists for carrying out the environmental functions (particularly legal, regulatory and planning tasks) that remain government responsibilities. At the same time, many Bank-supported projects promote an increased use of the private sector, including NGOs, for the field implementation of many environmental activities, such as delivery of urban services, protected area management and environmental monitoring.

Environmental technical assistance projects seek to strengthen the institutional, legal and regulatory framework for environmental management, usually at the national level. This assistance often supports the purchase of monitoring and analytical equipment (see box 2, for example). The key objectives of several current projects show the importance given this support: (a) the Environmental Technical Assistance Project in Bolivia aims to strengthen environmental agencies, improve the country's legal and regulatory framework, and promote environmental education; (b) the Environmental Institutions Development Project in Chile supports the establishment of an institutional framework for managing environmental protection and conservation of natural resources; and (c) the National Environmental Project in Brazil decentralizes the formulation of policy and regulatory frameworks (described in box 5).

Box 5. Lessons from an early environmental protection project in Brazil

This $117-million loan, signed in August 1990, was the first national environmental project supported by the Bank. The principal objectives were to strengthen Brazil's regulatory and institutional framework and capacity for protecting the environment and to support protection of specific endangered ecosystems, in particular the Atlantic Forest, the Coastal Zone and the Pantanal wetlands. As originally envisioned, the project had three components: (a) improved protection of fifty conservation areas, studies of the feasibility of establishing twenty more, and actual establishment of five; (b) protection of ecosystems (including projects for the environmental management and protection of special ecosystems); and (c) strengthening of the Brazilian environmental agency, IBAMA, and key state agencies.

Several valuable lessons have been learned in the implementation of this project.

- Institutional strengthening should occur before an agency is taxed with project implementation. The bulk of project funds and focus was on the strengthening of IBAMA. Simultaneously, however, with training and reorganization, the agency was expected to implement two ambitious project components. The agency simply did not have the organization or trained personnel to carry out these functions, necessitating heavy involvement and supervision by the Bank.
- Strategic planning should be the first element of any institutional strengthening activities. The institutional strengthening component did not have a sufficiently clear direction or vision of the new agency's functions or mandate. As a result, the training activities were not always appropriate to developing capacity to perform strategic tasks, and funds were expended without achieving intended results.
- When the implementing agency undergoes major restructuring after project preparation, further loan processing or implementation should await the necessary institutional and strategic planning studies. In this case, IBDF, the agency previously in charge of national parks and biological resources and originally intended to be strengthened under the project, was dissolved. After

Establishing national priorities and strategies

Lack of an environmental development strategy can limit a country's ability to prioritize environmental problems and assign adequate human and capital resources to them. Improved environmental planning can help ensure that scarce financial and institutional resources are used to maximum effect. Agenda 21, the main operational product of the Earth Summit, calls for states to adopt country-driven development strategies that are environmentally sustainable. Such strategies should prioritize environmental

two years of project preparation, just as the project was about to be approved, the four major Brazilian environmental agencies were merged into one, IBAMA. (All four agencies had had different agendas and priorities.) IBDF was broken apart and absorbed into various offices in this agency.

- Project design should be simple and targeted to a specific issue or objective, especially when the implementing agency is building needed capacity. The complexity of project design made it difficult for the Bank or its Brazilian counterpart to supervise the multitude of activities and executing agencies. After priorities have been set and the agency strengthened to execute tasks associated with those priorities, a project focused on only one—or at most two—priority actions should be undertaken.
- Sufficient time, resources and attention should be given to capacity building in the executing agencies to comply with Bank and project rules. Guidelines and project design should be simple to minimize the number of implementing agencies requiring training in Bank procedures. Particularly problematic in this project was the number of executing agencies involved, each of which had to handle its own procurement and planning.
- Most environmental problems are local and cross-sectoral and require local ownership and accountability for their resolution. Environmental planning, policymaking, and regulation therefore often require a cross-sectoral and regional (decentralized) approach. This project attempted to treat environment as a sector, much like energy or transportation, and to subject it to a centralized and regulatory approach. National policies and regulations were set under the project that were not suitable to every region of the country, had not been subject to local approval, and sometimes were not adequately based in scientific fact. Under the project restructuring, IBAMA will shift its role increasingly away from direct intervention toward monitoring, information clearing, and technical assistance. The restructured project will directly support state agencies that will now have greater power to set their own policy and regulatory framework. Sustainability will require that these state agencies have local accountability and build a local constituency.

problems and identify their direct and underlying causes, determine investment needs (such as external financing), and outline appropriate policy and capacity-building interventions. National environmental strategies provide a framework for integrating cross-sectoral environmental concerns into the broader context of a country economic and social development program.

The Bank supports environmental planning efforts by assisting in the preparation of NEAPs and country strategies. Experience suggests that the preparation of NEAPs is most successful when it involves those responsible

for economic as well as environmental decisionmaking. Strong emphasis has been put on helping countries develop and maintain ownership of their plans and on involving the people most likely to be affected. Although the emphasis of NEAPs varies from country to country, all stress prioritization, action-oriented plans, and country commitment (see box 6). NEAPs have been completed in Antigua, Barbados, Bolivia, Dominica, El Salvador, Grenada, Guyana, Honduras, Nicaragua, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. By June 1994, NEAPs were under way in Belize, Guatemala, Jamaica and Mexico.

Improving environmental management through policy reform

Since a substantial amount of environmental degradation is attributable to the underpricing of natural resources or major inputs, continued progress is needed in adjusting the prices of such items as fuel, agrochemicals, water and electric power. The following discussion provides an overview of the policy reforms especially needed to improve environmental management in the Latin America and Caribbean region.

AGRICULTURE. Agricultural policies should emphasize improved but sustainable production on existing lands, rather than expansion into new, forested areas. Many governments need to modify land titling and agrarian laws to avoid the current perverse incentives for deforestation in order to obtain land title or use rights. Policies are needed to improve the efficiency of land markets and promote sustainable growth in already settled areas. More rational use of irrigation water through improved pricing, tradable

Box 6. Donor cooperation in preparation of NEAPs in Nicaragua and Honduras

In Nicaragua, bilateral donors have provided resources for a team of environmental experts preparing the NEAP. The Bank worked closely with the donors in preparing terms of references and providing expertise in areas not covered by the bilateral assistance. The financing of Bank assistance came from the Institutional Development Fund (IDF). The Ministry of Economy was the lead agency, with technical support from other line ministries and the Natural Resources Institute. In Honduras, the National Environmental Council, CONAMA, is the lead agency; key ministries have assigned counterparts or contact persons to assist CONAMA. The Bank has provided assistance (financed with an IDF grant) to the team of consultants preparing the NEAP and has assisted in the definition of macroeconomic and policy issues.

water rights, and better planning of infrastructure would help correct problems such as salinization, waterlogging and declining water supplies. Such water conservation measures would also avoid the need to construct new hydraulic infrastructure, such as dams, and their associated environmental costs. These efforts could be complemented by providing public subsidies for extension services to improve irrigation efficiency and soil management practices. In addition, the creation of water users organizations can provide a forum for coordinating and monitoring environmental effects and for financing investments to reduce pollution, soil conservation and salinization. Environmental problems associated with the use of agrochemicals would be reduced by ending subsidies and improving regulation and farmer education.

FORESTRY. Logging of natural forests often causes unnecessary damage and even deforestation. Careful logging can protect the environmental value of forests, while generating income and employment. Harvesting can be made more environmentally acceptable by changing the ways concessions are awarded and renewed. Stumpage fees and other forms of cost recovery also encourage sustainable forest management. In some countries forest plantations have become economically successful and environmentally sustainable.

Poor performance of forestry projects is due mainly to inadequate policies that have created perverse incentives and to weak institutional capacity. The future strategy should not focus just on specific reforestation, forest management and utilization projects but should help countries adopt appropriate policies and build strong institutional frameworks for policy analysis and enforcement. Such policies could include payments to private owners or communities for the establishment of plantations and for the public use of their native forests and wildlands (as is proposed in Argentina). The future protection of biodiversity, as well as the livelihood of forest dwellers, depends on the participation of local people and the private sector in long-term forest management and the implementation of environmentally sound forest conservation and development plans.

Forest sector studies are under way in several Latin American countries and for Central America as a region. These studies aim to (a) formulate forestry policies for land use, concessions, privatization, taxation and subsidies royalties (in Argentina and Bolivia); (b) assess the economic and biological constraints to sustainable development of different management options (in Chile); (c) review the constraints to sustainable development of the natural resource and forestry sectors (in Brazil and Mexico); and

(d) determine the source of inconsistencies between government forestry plans and private sector behavior (in Costa Rica).

ENERGY. Governments continue to have an essential role in the environmental regulation of the energy sector. There is a need to incorporate environmental considerations into the process of selecting new projects. For example, some hydroelectric projects in Latin America and the Caribbean inundate up to 6,000 times as much land per unit of power

Box 7. Energy sector privatization and the environment in Jamaica

This project is a good example of cooperation between government and the Bank, illustrating as well how a project can be strengthened through careful environmental assessment. Furthermore, the project sets a precedent for some of the environmental issues (asbestos abatement; PCB management; spill prevention, control and contingency planning; and redesign of storage facilities) in other projects in the Caribbean.

As part of the deregulation and privatization of the energy sector in Jamaica, the World Bank is helping the Jamaica Public Service Company (JPSCo) to install a total of 120 megawatts of power generation capacity at Hunts Bay and Rockfort (both in Kingston).

An environmental assessment was conducted and a mitigation plan was prepared for each facility. The plan for Hunts Bay encompasses the existing power plant, as well as the new, adjacent one. The combined environmental discharge of sulfur dioxide and nitrogen oxide from both facilities was assessed. In order to reduce sulfur dioxide emissions, limitations were put on the sulfur content of fuels used, operating hours of the existing facility were reduced, and equipment was required to measure stack emissions and the air quality at receptor points. It was determined that some of the environmental conditions at the existing facility could affect the new project, and mitigating measures were designed. As asbestos was encountered on equipment and pipe insulation and PCBs were identified in transformer oil, a detailed survey of these materials was carried out, and asbestos and PCB management plans were prepared for implementation. Furthermore, about 1,000 cubic yards of oil-contaminated soil were incinerated at a nearby cement plant. Further contamination prevention measures were taken through constructing berms around storage tanks and transformers, drafting oil spill contingency plans, and redesigning storage facilities. The project also includes development of a noise monitoring plan and groundwater investigation.

The Rockfort project has some similar components, with the additional issue of resettlement of about ten fisherman families living at the proposed site. A public meeting held in Kingston and attended by concerned citizens, NGOs, and government representatives supported the project.

generated as other projects. For example, the Pehuenche Hydroelectric Project (Chile) has a capacity of about 500 megawatts and inundates only about 400 hectares of land, while the Brokopondo Dam (Suriname) has a capacity of only about 30 megawatts and inundates about 150,000 hectares. Today the more wasteful alternatives are increasingly being rejected in favor of more efficient solutions to meeting energy needs. There is also scope for energy demand management by raising prices (eliminating subsidies) and promoting energy conservation more aggressively (see box 7).

Privatization of the power sector may imply fewer giant projects in the future, since investments will be subject to greater discipline from market forces. Argentina, Bolivia, Ecuador and Peru are receiving Bank-financed technical assistance for privatization of their oil and gas industries. This sector has traditionally been one of the greatest polluters in South America and possibly the most harmful to rural and indigenous peoples. The Bank has assisted with in-depth environmental audits of facilities and operations, including areas covered by existing or potential private exploration or development projects. Environmental audits are conducted by a third-party consultant prior to privatization. These audits (a) identify liabilities associated with past operating practices, current operating practices, and the design features of the facilities and operations; and (b) specify mitigatory measures along with their respective capital and operating costs. The environmental laws and regulations of the country, the World Bank Environmental Guidelines, and the Occupational Health and Safety Guidelines, as well as internationally accepted environmental laws and regulations have been used as benchmarks in conducting these audits. The audits are used to clarify environmental risks and liabilities in the bidding and sales documents, and they detail measures to be taken by new owners within a specified time.

The primary question regarding environmental issues in privatization is whether the private sector will police itself better than the public sector did. The experience with privatization is still new, but there is reason for encouragement. Privatization will relieve the government from conflict of interest in fulfilling its regulatory role of controlling harmful environmental practices and providing market-based incentives for the private sector to behave in the public interest. This pressure and the fact that private firms tend to be more conscious of their public image may exert a steady influence toward better environmental management under privatization.

INDUSTRY AND MINING. The wide variety of mining techniques used in the region entail different environmental problems, including water pollution from tailings and sediment and production of toxic substances (such as mercury in gold mining). These problems can generally be controlled by using different mining technologies and practices (that are economically viable) as is proposed in the Bolivia Mining Sector Rehabilitation Project. Strong regulatory and enforcement mechanisms, however, are necessary to bring this about. Special efforts are also needed to organize artisanal (informal) miners to use less-damaging methods.

INFRASTRUCTURE. Greater care is needed in the planning of investments to avoid damage to environmentally sensitive areas. For example, new roads through forested areas should be built only in exceptional circumstances. Generally, new roads should be constructed only in well-settled areas, away from the forest frontier. Rights-of-way for transportation corridors, water supply lines and sewerage collectors are vital for improving urban environments, but the location of these can be optimized to reduce the number of people that must be displaced and resettled. The Bank has worked with the governments of Brazil, Colombia and Venezuela to restrict costly resettlement requirements to the minimum in urban infrastructure investments.

NATURAL HABITATS PROTECTION. Since the main threat to most animal and plant species is the loss of natural habitats, the most important tool for biodiversity conservation is an ecologically representative network of protected areas. Vital ecosystem types in Latin America and the Caribbean are still currently not incorporated within protected areas. Equally important is the need to improve the management of the existing areas, many of which are only "paper parks." This will require action on several fronts. Recurrent costs need to be met, perhaps by recovering costs from park users or through trust funds and endowments. Many protected areas also need to be managed under multiple-use systems to accommodate the needs of local people. Because the most important natural areas in some countries are on private lands and acquisition costs might be prohibitive, cooperative arrangements with landowners may be useful. The management of the protected areas can also be contracted out to NGOs.

Several recent projects have protection of natural habitats as one of their major objectives. The Mexico Northern Border Environment Project, for example, will support the establishment and strengthening of several protected areas along the U.S. border. The Natural Resource Management

Program in Colombia seeks to improve management of nine national parks. The Paraguay Natural Resources Management Project will improve management of the San Rafael National Park. A group of natural resources management projects in Brazil will assist in the creation, expansion or improvement of protected areas, including the Rondônia Natural Resource Management Project, the Mato Grosso Natural Resource Management Project, and the Land Management I (Paraná), II (Santa Catarina), and III (São Paulo) projects.

Increasing the knowledge base for environmental action

Considerable resources have been devoted to studies of environmental issues in the Latin America and Caribbean region through Bank research. One such study, "Brazil: The Management of Agriculture, Rural Development and Natural Resources," was the basis for discussion with the government and for regional workshops involving NGOs, the press, farmers' groups and other stakeholders. These discussions focussed on agricultural practices that degrade the land, the environmental effects of insecure land tenure, and policies that encourage clearing forests to establish plantations and ranches. Other studies completed in fiscal 1994 include: "Mexico: Natural Resources and Forestry Sector," "Mexico: Integrated Pollution Management," "Central America: On-Farm Soil and Water Management," "Costa Rica: Forestry Sector," "El Salvador: Natural Resources Sector," and "Chile: Managing Environmental Problems" (described in box 3). Environmental issues and strategy papers were completed for Uruguay and Belize. Box 8 describes a program for providing information on deforestation in Paraguay.

A recently released study by the Bank focuses on environmental management and urban vulnerability in Rio de Janeiro. This case study was part of a research project on disaster prevention and mitigation in metropolitan areas in developing countries undertaken by the World Bank and the United Nations Center for Human Settlements (UNHCS-Habitat). Its findings were published in a World Bank Discussion Paper entitled "Toward a Sustainable Urban Development: The Rio de Janeiro Study."

Studies are under way in Latin America to document the sources of policy failures and successes in managing natural resources. One study addresses such issues as the impact of trade policies on natural resources, appropriate policy instruments to promote the conservation of resources,

Box 8. Improving the information base for land use rationalization in Paraguay

Paraguay is experiencing deforestation at an estimated rate of 4.7 percent annually, the highest rate of any country in Latin America and the Caribbean. Most of this is occurring in the eastern region where good soils, export-oriented crop production, and government sponsored colonization has caused rapid and accelerating loss of natural forest cover, including tropical moist forests—the habitat of hunter-gatherer indigenous forest dwellers. This project was designed to give the government the information base necessary to establish and implement rational natural resource management policy in the eastern region of Paraguay. Over five years, it would complete a rural cadastre, establish a Geographical Information System (including reconnaissance of the level of soils, land capability and use, and agro-climatic zoning information), and conduct a number of studies and policy analyses aimed at the rationalization of land use and the strengthening of natural resource management institutions.

The basic premise of the project is that a good information base is a necessary, if not sufficient, condition to change government (and societal) attitudes and policies. The project will also test the premise that secure land tenure is a prerequisite for improved husbanding of resources. It is hoped that secure title can change the common practice and perception in Paraguay that deforestation is necessary to prove productive use and to obtain legal title, ward off invaders, and avoid the risk of legal expropriation.

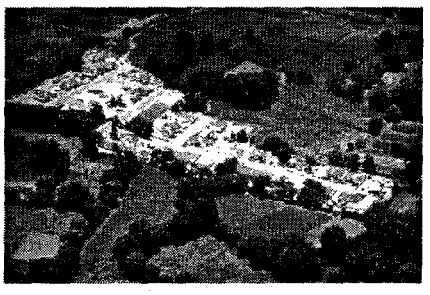
The project would use the information generated in the creation of a cadastre and a GIS to link the fiscal and zoning policies and enable the implementation of the federal land tax. The tax structure would be based on classification of land potential, with higher rates for those with high agricultural potential, and lower rates for lands that are steep, have poor soils, border rivers and streams, or have high conservation value.

As a result of the project the public will, for the first time, have access to powerful natural resource information. For example, maps showing soil taxonomy, land capability, actual land use and zoning will be made publicly available through a series of seminars.

and the roles of different levels of government in the management of resources. Another study, nearing completion, reevaluates the incentives that drive frontier development dynamics to determine why governments do not exercise more effective control. Policy failures notwithstanding, the study concludes that there are great public and private incentives for developing the frontier along unsustainable lines. It also finds, interestingly, that some agricultural development previously believed to be unsustainable is in fact both agronomically sound and financially attractive. An important

finding is that accounting for global externalities may tip the balance toward conservation of some frontier areas, since the implied value of carbon sequestered in frontier forests at even modest shadow prices is several times greater than the most profitable development use to which this land can be put.

Several coastal zone management studies were carried out in the past year. One such exercise involving the Caribbean region identified four main problem areas: pollution, alteration or destruction of natural coastal ecosystems, beach erosion and beach sand mining, and natural disasters. A twofold approach is proposed to deal with these problems involving both the establishment of effective coastal zone management agencies and the integration of economic and environmental planning to minimize negative impacts from coastal development. An underlying theme is that economically important activities such as tourism and fisheries depend on unpolluted coastal waters. The report confirms that many countries may be destroying coastal marine ecosystems because they undervalue the potential benefits of undamaged coastal waters, and it illustrates a range of ways to use marine resources more sustainably.



Addressing the environmental impacts of projects

Many environmental problems in Latin America and the Caribbean are still caused by the lack of environmental assessment (EA) for projects or policies and by decisions taken with little knowledge or understanding of their environmental impacts. The process for environmental assessment of projects is systematized within the Bank and in some countries in the region. All projects funded by the Bank are screened for possible environmental impacts at an early stage of preparation and a team of professionals follows the project through scoping, review and clearance. As a result of screening, more than half of all projects have been subjected to environmental analysis and about one-fifth to full environmental assessment.

EAs help build environmentally sound development programs and projects by identifying potential adverse effects early enough that designs can be modified to avoid them or management and monitoring measures can be found to reduce or compensate for those that are unavoidable. Because an EA identifies the direct and indirect environmental effects of a project and, therefore, the environmentally sound options, it helps avoid the costly corrective measures necessary in the wake of badly designed projects. The requirement for public disclosure, moreover, provides a valuable opportunity for public involvement through consultations that can speed up the process of identifying negative impacts and can enlist the valuable support of the community in trying to make the project work well throughout implementation.

To be effective, projects must be not only environmentally but socially sustainable. Although much has been done to systematize and internalize social concerns, the social variables of development still are often not adequately addressed. Efforts are therefore under way in the Bank to improve social analysis in specific areas (for example, in resettlement operations, poverty assessments, and indigenous peoples and gender issues) and to explore new ways of reaching the poor through people's direct participation, NGO intermediation and building institutional capacity. Bank specialists have worked with several Latin America and Caribbean governments to review bottlenecks to effective resettlement administration.

This section discusses the specific aspects of typical EAs (such as technical procedures and participation) and various types of EA (in sectoral and privatization operations, for example). In addition, an overview is provided of how EA relates to special social concerns regarding indigenous peoples, resettlement and cultural property.

Improving environmental assessment

The World Bank has several important environmental and social policies that govern project work. Procedure for EA is provided in Operational Directive (OD) 4.01[4] for both environmental screening of all Bank investment projects and any subsequent EA studies needed. This procedural guidance is supplemented by natural resources policies, particularly on: natural habitats (Operational Policy [OP] 4.04),[5] forestry (OP 4.36), and agricultural pest management (OD 4.03). Relevant Bank social policies provide guidance for projects involving indigenous peoples (OD 4.20), involuntary resettlement (OD 4.30), and cultural property (Operational Policy Note [OPN] 11.03).

Bank-required EA studies are having a positive impact on borrower EA capacity. EA (and more broadly good environmental management) is being institutionalized within government agencies in Latin America and the Caribbean so that it will be done routinely and not just for Bank-financed protects. Toward this end, the Bank promotes the formation of environmental units in sectoral agencies. For example, the Colombia Third National Roads Sector project supports the establishment and strengthening of an environmental unit within the Ministry of Public Works and Transport. This strengthening of line agencies such as agriculture, public works, mining, hydrocarbons, electric power, water, and so forth complements Bank support directed to central environmental planning agencies through environmental

technical assistance projects. For example, the environmental and resettlement department responsible for the Argentina Yacyretá Project was significantly strengthened through the EA process to manage the complex effects of the project, including loss of wildlands (see box 9).

Box 9. Compensatory protected areas for the Yacyretá Hydroelectric Project

When loss of natural habitat is unavoidable, the Bank requires that compensatory protected areas—of no smaller area and ecologically similar—be established. The Yacyretá Project loan is an example of the application of this policy. The Yacyretá Hydroelectric Dam, a binational project on the Paraná River between Argentina and Paraguay, was designed during the 1970s and partially constructed during the 1980s. The project's civil works were about 80 percent completed when the Bank approved a loan in 1992 to facilitate project completion. As preparation for the loan, the Yacyretá Binational Entity (EBY) prepared a detailed Resettlement and Rehabilitation Plan for the approximately 50,000 people who will eventually need to relocate. EBY also prepared a comprehensive Environmental Management Plan to address issues such as water quality, fishery management, public health, and archaeological salvage, as well as compensation for the loss of natural habitat due to reservoir flooding.

The Yacyretá reservoir is expected to inundate 107,600 hectares, of which 105,000 hectares are natural ecosystems, including native grasslands, marshes and other wetlands, and gallery forests. In the past year, the Bank supported completion of the Yacyretá hydroelectric scheme on the Paraná River. As a result of the EA process, the new loan supports a network of compensatory protected areas presently encompassing about 92,500 hectares. The process is well under way for the provision of legal protection to another 32,700 hectares. It is therefore expected that the system of protected areas will soon total 125,000 hectares, greater than the area inundated by the reservoir. Other wildlands are under study for incorporation into the protected areas system

The project provides for wildlife rescue and relocation to offset the loss of natural ecosystems because of the reservoir. Water contamination and health-related problems will be prevented through improved water supply and wastewater collection, treatment and disposal systems in the riverine cities Posadas and Encarnación. The project will provide technical assistance for industrial pollution control. Potentially important archeological remains and historical structures are being recorded and salvaged. In addition, the project will support improved management of the Paraná River's native fish species. The construction of water releases for electricity generation will take into account environmental objectives as well. The project's resettlement operation is designed to ensure, through the active participation of local governments and affected people, that all displaced families are reestablished in improved socioeconomic conditions, including new dwellings or business establishments, as well as improved health, literacy and education, and community development services.

Environmental manuals have been prepared as well, for example, for the Third Ecuador Social Development Fund Project, which assists poverty alleviation efforts by the government. These manuals facilitate the screening for environmental impacts from subprojects—such as for schools, health centers, irrigation systems, and family gardens—identified in the course of project implementation.

Increasing public participation and consultation

Experience thus far with public participation and consultation in the EA process has shown it to be an important tool for identifying often overlooked environmental risks and for building consensus behind environmentally sound projects, programs and policies. The Bank's EA OD 4.01 explicitly calls for public participation in at least two junctures: at scoping when terms of reference are agreed upon and when the draft environmental assessment is presented. A new publication, "Public Participation in Environmental Assessment: Best Practices," was prepared in fiscal 1994 by the Environment Unit of the Bank's Latin America and Caribbean Region. The paper reviews all EAs completed during fiscal 1990–94 to determine the factors contributing to effective consultation with and participation by affected communities, local governments, and interested scientific and other nongovernmental organizations in borrower countries. It finds that the process of consultation is a valuable part of the EA process that needs to be strengthened.

Today there is a wider range of stakeholders involved in development investments. The context of policy formation also has changed with democratization, decentralization, and the growing effectiveness of grassroots organizations and NGOs. The Bank recognizes that direct participation by beneficiaries, affected people, local governments and other stakeholders improves the quality and sustainability of investments. The Bank is also committed to more transparency through dissemination of project documents and economic and sector studies, as well as environmental assessments, in the Public Information Center at headquarters and regional offices. The Bank welcomes public input to these activities.

Several projects have confirmed the usefulness of broad public consultation and consensus-building. For example, the Extractive Reserves Project in Brazil is intended to test, in four areas, the process in which local communities are guaranteed exclusive access to non-timber forest products

in rain forests, so long as such use is sustainable. Public participation in the design of this project has been crucial. It allowed the local communities to influence the project design to best respond to their needs and ensured that they were fully informed about impacts that may result from the project. The EA focussed on management plans and mitigation activities that will be tested during the project implementation. The success of the participatory approach will be determined by the extent to which the local communities can maintain benign natural resource management strategies (see box 10).

Extensive public consultation was an important part of the EA of the Eastern Caribbean Solid Waste Management Project, because the siting of sanitary landfills is politically sensitive, particularly on small, tourism-dependent islands (see box 11).

The Lower Guayas Flood Control project in Ecuador, currently under implementation, provides flood control and drainage for the Lower Guayas Basin, reduces the risk of rural and urban flooding, improves health and

Box 10. Conserving the Brazilian rain forest

The Pilot Program to Conserve the Brazilian Rain Forest, a collaboration between the Bank and the government of Brazil, was initiated by the Group of Seven (G-7) countries in 1992 with the establishment of the Rain Forest Trust Fund. Administered and coordinated by the Bank, the program supports an integrated set of projects intended to contribute to a reduction of the rate of deforestation in the Amazon, while promoting sustainable development of its natural resources. The implementing agency of the project will be the Brazilian Institute for Renewable Natural Resources (IBAMA), but the National Rubbertappers Council and local reserve associations have also been closely involved with each step of project preparation.

Four projects have been appraised and are scheduled for approval in fiscal 1994 and 1995: (a) Science Centers and Directed Research (institutional strengthening of two research centers in the Amazon; (b) Indigenous Lands (demarcation of lands of indigenous peoples); (c) Demonstration Projects (experiments with approaches to sustainable development by local communities in the region); and (d) Extractive Reserves (assisting local communities in better utilizing four extractive reserves in the Amazon). These projects are designed to strengthen the capacity of the public sector to establish and enforce sound environmental policies, improve the management of protected areas, ensure that development helps local communities, and increase the knowledge base for conservation and sustainable use of the Amazon. To date, some $280 million has been pledged in financial and technical assistance; $58 million of this total has been pledged to the Rain Forest Trust Fund, under Bank trusteeship.

Box 11. Caribbean solid waste disposal: Benefits of community involvement in project formulation

Even in the initial stages of project preparation, consultants preparing the project consulted over 200 people from government, business and NGOs about project objectives and scope. After a preliminary final report was produced, it was proposed that the government hold a series of public forums to share information and stimulate discussion. The forums were also designed to obtain feedback on the summary table EAs prepared for each proposed sanitary landfill site.

Forums were held during appraisal in all six island countries with participation from the national and regional project coordinators. Some were held in the small communities closest to the major landfill site and others in the capital city. Most were televised and one had radio and TV call-in audience participation. The forums were useful in increasing awareness of the project, in clearing up misunderstandings, and in giving the public a voice in sharing their concerns with government. In the case of Grenada, the forum was instrumental in bringing to light an important issue overlooked in the EA for the island—the presence of the endangered Grenada Dove (*Leptotila wellis*) in the area proposed for the landfill site. Because of this discovery, experts were hired to undertake further studies of the area and propose means of protecting the dove while still addressing the needs for solid waste disposal. The project underscores the importance, therefore, for formal as well as informal public consultation, especially in the communities where public works are to be undertaken.

living conditions in the area, supports agricultural development and protects natural resources and the environment. The terms of reference for the EA called for consultations to ensure that the views of affected people and NGOs be taken into account. Due in large part to this extensive consultation with local NGOs, a national NGO and local scientific expertise, the project design was altered, despite higher costs, to change the alignment of the flood evacuation canals to save an important wetland area. In addition, because of NGO concerns that the proposed large outlet from the new reservoir would damage mangrove forests in the estuary, a multi-outlet design was developed with their assistance. Mechanisms for having NGOs monitor project implementation were developed and are currently operational.

The EA for the Colombia Energy Sector included a consultation process involving forty-five relevant organizations. A draft of the sectoral environmental assessment (SEA), which identified the main environmental issues and proposed a five-year action plan for the electricity sector, was sent to concerned national ministries, energy agencies for petroleum and

gas, relevant NGOs and foundations, government and private universities, business and professional organizations, representatives of populations living in the area of existing electricity plants, and the ten electricity companies in Colombia. All were invited to a two-day workshop at the end of which an official act was signed by all the power utilities, the Ministry of Energy, the National Planning Department, and the national institute responsible for endorsing the SEA findings and recommendations. Participation was thus critical to producing national agreements on environmental priorities for the electric power sector, defining clear institutional responsibilities for strengthening environmental management in the sector, and achieving the necessary public support for developing sectoral expansion sustainably.

The major environmental issues of the Espírito Santo State Water Project in Brazil, which provides potable water, sewerage and sewage treatment systems in twelve urban areas, centered on the location of sewage treatment plants. Through public participation in the EA process, two locations were identified where communities would seriously suffer from construction of the facilities. One plan would have eliminated clay deposits vital for the subsistence of traditional artisans, the *paneleiras*. The engineers and artisans jointly decided on mitigatory measures for securing the local artistic tradition, lifestyle and livelihood of the people: the artisans were guaranteed legal access to a new clay deposit; technical assistance and training in new clay technologies were offered; transport and storage of clay was organized; instruction in commercialization techniques was provided; and a sales outlet in the state capital Vitoria was set up. In the second case, the location of the proposed wastewater plant would increase the impacts in a neighborhood already burdened with a composting plant, a quarry and an asphalt plant. During public meetings, inhabitants expressed their distress over the proposed location. In cooperation with the state Water Company and the Secretary for Environment, an acceptable solution was found, calling for more green areas, tree barriers, and recreational areas in the community.

Coordination and collaboration between environmental NGOs and government is exemplified in the Yacyretá II project in Argentina. The major environmental and social impacts of this project were addressed through an Environmental Management Plan and a Resettlement and Rehabilitation Plan that were agreed on during project preparation. Implementation of these plans will be monitored by teams from local universities, evaluated semiannually by a panel of international experts, and evaluated annually by independent auditors. The results of these reviews will be shared with

NGOs throughout implementation, and they will have the opportunity to offer their comments and suggestions to the Bank and the government.

Extensive local community and farmer participation in the planning and implementation of watershed management activities is a key feature of land management projects in Paraná and Santa Catarina, Brazil (see box 12). Experience in Paraná demonstrates the benefits of decentralization in the selection of micro-catchments and the specific interventions to be applied. Systematic economic and environmental monitoring of pilot watersheds has demonstrated the benefits of coordinated on-farm soil conservation and micro-watershed management to farmers and government officials in other parts of the state and elsewhere in Brazil.

Expanding the use of sectoral EA

The Bank often funds sectoral investment programs involving multiple subprojects. These operations frequently support policy reform or sectoral restructuring, for which project-specific environmental assessment is not appropriate. In these cases, the Bank requires a sectoral EA (or SEA) to deal with environmental impacts across the whole sector. A sectoral EA does not evaluate the impact of a single project, but looks at the institutional capabilities, the legal and regulatory framework, and mitigation measures characteristic of the sector as a whole. An important advantage of SEA is that it allows a comparison of the environmental implications of different investments and an evaluation of the cumulative impact of many, relatively small projects, any one of which might not warrant a full EA. To assist borrowers, technical guidelines for SEAs in the power sector have been prepared by the Bank and are under preparation for other sectors.

The first sectoral EA for the power sector in Latin America and the Caribbean has been completed in conjunction with the Colombia Power Sector Technical Assistance Loan. The sector is being restructured and privatized; and at the same time, a Ministry of Environment is being established under a new constitution, and the government is strengthening the process of public consultation on development issues. The SEA yielded (a) a diagnosis of the biophysical, socioeconomic and sociocultural implications of existing facilities, as well as projects under construction or to be initiated over the next fifteen years; (b) an analysis of the current environmental management system, including studies, sectoral policies, and mechanisms for decisionmaking and public consultation; (c) an assessment

Box 12. Successful grassroots efforts in Brazil Land Management I (Paraná) and II (Santa Catarina) Projects

The two Brazilian Land Management Projects, I (Paraná) and II (Santa Catarina), have achieved spectacular success in correcting natural resource problems, improving natural resource management, and attaining a level of sustainability. Both projects seek to alleviate widespread soil erosion, declining soil fertility and productivity, and the silting and contamination of water sources resulting from the land use practices on large and small farms. The projects encourage farmers to convert to sustainable production systems and management practices that minimize erosive runoff and to safely dispose of remaining runoff from agricultural land and roads.

The projects are truly a grassroots effort, based on concepts developed by the most progressive local farmers, together with local extension agents, as a local response to locally perceived problems. The Bank and the United Nations Food and Agricultural Organization (FAO) came into the picture only to provide technical assistance and help perfect a project design that was already well thought out.

Key project components are extension, research, road reshaping, and a soil conservation fund. The fund provides individual farmers, or farmer groups, with part of the cost of new equipment needed for improved land management, water supply systems for agro-chemical mixing points, the implementation of land management practices, reforestation, and the provision of seeds and barriers to runoff. The rationale is that part of the benefits of these investments are external to the farmer's land. Additional components include nurseries to produce seedlings of native species, mapping/remote sensing, and demarcation and protection of parks and biological reserves.

The projects are also decentralized and democratic in their oversight and management. The basic unit for implementation is the micro-watershed. An improved management plan for each micro-watershed has been created by extension agents working with the local land users. The plan is built up through the consolidation of individual farm plans and then the plans of small neighbor groups, all of which are approved by local micro-watershed committees. The community design, and the fact that the success in one farm is linked to participation of neighboring ones encourages the development of community spirit and self monitoring.

Requests for support for the final plan from the soils conservation fund, as well as road improvement plans, are submitted to a municipal soils conservation committee on which farmers, extension agents and local authorities are represented. Municipal committees, in turn, submit approved proposals to regional, then state, level committees—a hierarchy to ensure via peer monitoring the equitable and transparent use of resources from the soil conservation funds and roads component.

The projects have been successful in encouraging widespread adoption of sustainable land management techniques, which were confined to only a few pilot micro-watershed in the late 1980s. In Paraná, many micro-watershed have completed plan implementation and now have a well laid out and manicured appearance. Gains from both projects by farmers have included relief from washouts of newly seeded crops, floods, bacterial contamination of farm and municipal water supplies, and declining farm productivity.

of current environmental constraints and potential for energy sector development; and (d) proposals for strategies for reinforcing environmental management over the next five years. The SEA followed an extensive program of consultation (discussed in detail in the section above on public participation).

The sectoral EA for the Bolivia Environment, Industry and Mining Project was a major contributor to project design. Through institutional analysis, it helped design project components for strengthening environmental management and planning capacity in the sectors and enforcement capacity of the Ministry of Sustainable Development and Environmental Protection. One project component will establish an operating EA system for Bolivia, as well as environmental standards for industry and mining. A series of recommendations, directed to environmental problems generated by industry and mining, were incorporated into project design, including policy, legal and institutional reforms and improved environmental legislation; cleanup activities in connection with privatization of mines and industries; and thirty river basin environmental management plans in regions particularly affected by the two sectors.

Sectoral EAs for the power sectors in the Dominican Republic, El Salvador, Trinidad and Tobago are expected to be completed in early fiscal 1995. SEAs have also been initiated for the mining sectors of Argentina, Ecuador and Peru and for the solid waste, aquaculture and forestry sectors in Mexico.

Applying environmental assessment in privatization

Important environmental issues are being raised in the processes of privatization under way in the Latin America and Caribbean region. The Bank has been assisting in the development of approaches that address the concerns of potential investors who want to ensure that operations do not bear unrecognized environmental liabilities and who expect some stability and transparency in the environmental policy framework. International business investors are also sensitive to environmental issues, because they are concerned about their environmental image—increasingly important in international markets.

The Bank is assisting several countries in Latin America to corporatize, commercialize, or privatize inefficient public enterprises. Many water and sanitation and irrigation projects support privatization by offering technical

assistance to public or private corporations, autonomous agencies, or statutory bodies taking over inefficient state-run enterprises. Privatization of such enterprises frees the government from conflict of interests in regulating environmental practices or offering market-based incentives to the private sector for reducing negative environmental practices.

Guidelines[6] for privatization loans have been prepared to ensure that EA and environmental auditing procedures, including "clean site closure," are adopted. The following steps are recommended:

- Enterprises scheduled for privatization should be screened for preexisting environmental impacts, potential hazards, and the effects of ongoing operations and new investments planned.
- Environmental audits should be conducted for enterprises with significant actual or potential adverse environmental impacts related to past or ongoing operations, and assessments should be carried out for enterprises for which major new investments are planned.
- Before sale, assurance should be received that the state and the private investors have reached agreement on the allocation of responsibility for executing and funding the mitigatory measures identified in the audit or assessment process.
- Mechanisms should be put in place, including financial resources, for the monitoring of the agreed actions.

The World Bank generally recommends that the state, as prior owner, take most or all of the financial responsibility for environmental problems associated with past operations, while new investors are obliged to take measures needed to bring enterprises into compliance with applicable environmental standards (perhaps over a specified period). Putting in place a clear legal statement to underpin such a policy—as opposed to relying only on contracts associated with individual privatizations—can increase investor confidence and contribute to the success of the overall privatization process.

Methodology for EA in privatization of industrial facilities in Latin America and the Caribbean has been developed and applied to various projects, including the power sector in Belize, Jamaica, Peru, and Trinidad and Tobago; the hydrocarbon sector in Bolivia; the sugar industry in Guyana; and miscellaneous industries in Argentina, Guyana and Jamaica (see box 13) for a description of the process in Bolivia.

Protecting the rights of indigenous peoples

The World Bank was the first multilateral agency to issue an explicit policy for the treatment of indigenous peoples in internationally financed development projects. The initial Bank policy, dating back to 1982, was designed to address issues pertaining to relatively isolated and unacculturated indigenous peoples.

In 1991 the Bank issued a revised policy (OD 4.20) based on Bank experience with projects affecting indigenous peoples, as well as on guidance by other international agencies. It maintains the original core of protective measures and extends the definition of indigenous people to include groups with social and cultural identities distinct from those of the dominant society in which they live and groups that are disadvantaged in the development process. These groups include isolated forest-dwelling indigenous

Box 13. Privatization and environmental norms in Bolivia

Bolivia provides a good example of how the Bank assists countries in the process of privatization, institution building, and legislative reforms—and how incentives and sectoral norms and standards can be improved in the process. YPFB, the national oil company and largest state-owned enterprise, has been a de facto monopoly since nationalization of the sector in 1969. By 1992 it owned and controlled more than 65 percent of natural gas production and 81 percent of the production of liquid hydrocarbons and gas processing. Since 1985, YPFB transferred 65 percent of its domestic and 55 percent of its export sales revenues to the treasury, which left it inadequate resources for maintenance and development. In addition, the government regularly intervened in YPFB's operations, and the company experienced severe organizational and managerial problems, manifested in declining efficiency and productivity and inadequate environmental management. Technical assistance to YPFB supports detailed audits to evaluate performance; definition of organizational objectives and strategies and preparation of a timetable for restructuring; valuation of business activities selected for privatization; prefeasibility and engineering studies of selected business activities to improve productivity and efficiency; and an environmental component. The environmental component is designed to identify existing environmental problems in the industry, devise mitigating measures, establish environmental standards and procedures, and improve institutional capabilities for monitoring activities (including exploration, exploitation, processing and distribution of hydrocarbons). It will also support completion of studies on the feasibility of regulatory instruments of environmental management (based on quantity and price) and will promote environmentally sound technologies and practices and occupational health and safety.

Box 14. Demarcating land for indigenous peoples

Many indigenous people rank among the poorest of the poor in Latin America, and one of the major reasons is insecurity of tenure rights to land and natural resources. The Polonoreste Project in Brazil, financed by the Bank, demarcated 5.4 million hectares of land for Amerindian groups. In Bolivia, the Eastern Lowlands and Natural Resources Management and Agricultural Production Project is demarcating 150,000 hectares for the Ayoreo and Chiquitano People. The Colombia Natural Resources Management Project is establishing secure rights to 4 million hectares for Afroamerican people and another 1 million hectares for Amerindian people. In Brazil, the Mato Grosso and Rondônia Natural Resources Management Projects are together demarcating over 2 million hectares of land for the Karipúna, Paboti, Macurup, Sakirabi, Arára, Parei, Myky Irantxe and other indigenous groups. And in Paraguay a natural resources management project is demarcating and titling 6,500 hectares for 1,285 Tupí Guaraní families. In all, Bank lending to date is supporting the regularization of more than 13 million hectares of land for indigenous people, an area three times the size of Denmark.

populations as well as the indigenous peasants of South and Central America. The revised directive also strengthens the previous policy by stressing the need to promote the informed participation of indigenous people in planning development projects and to ensure their sharing in the social and economic benefits from them. It highlights the importance of incorporating the concerns of indigenous peoples into economic and sector work, technical assistance, and institutional strengthening.

Most indigenous communities must contend with challenges from outsiders who want to use their land and water resources, for example, in forestry, ranching, and extraction of minerals. Indigenous peoples are handicapped in meeting these challenges by their lack of clear land ownership. As a first step, demarcation and registration of areas traditionally inhabited and used by indigenous people is necessary (see box 14).

The Bank's Latin America and Caribbean departments are working with other multilateral development agencies and the new hemispheric Indigenous Peoples Fund to design a training and capacity-building program for indigenous peoples (see box 15).

Countries are beginning to create legal indigenous areas and codify rights. Special social services are also being introduced to counteract health or other social problems resulting from contact with settlers. The cultural

resurgence of ethnically distinct groups in the region is being supported in three ways:

- All Bank-supported projects that affect indigenous peoples must include a related development plan to address specific issues, including protection of land rights.
- The Bank has launched an initiative for training indigenous organizations in developing their own strategies utilizing an Institutional Development Fund grant (to Bolivia, Chile, Guatemala, and Mexico in 1994; five others anticipated in fiscal 1995). In this way land demarcated can be developed for the benefit of the inhabitants.
- The Bank has also played a major role in providing access to investment capital for local indigenous organizations through, for example, the Decentralization Project in Mexico and the Social Investment Funds in Bolivia and Ecuador.

Box 15. Development strategies and indigenous peoples

The United Nations General Assembly designated 1993 the beginning of the "International Decade of the World's Indigenous Peoples." International development agencies have been challenged to work together to promote the development of indigenous peoples and to alleviate poverty. In September, 1993, a regional interagency workshop was held in the Bank, bringing together representatives of the International Fund for Agricultural Development (IFAD), International Labour Organization (ILO), Economic Commission for Latin America and the Caribbean (ECLAC), Pan American Health Organization (PAHO), Inter-American Development Bank (IDB), and the Bank. With the support of the Swedish International Development Agency (SIDA), representatives of ten indigenous NGOs from the region were also able to participate. The proceedings of the workshop were published in Spanish. Three main themes were discussed: (a) the current status of indigenous people and their organizations, (b) government policy toward indigenous people, and (c) strategies for development of indigenous people adopted by interested organizations. The presentations questioned the validity of development models being applied in Latin America. It was argued that these accentuated poverty and ecological decay. However, it was recognized that progress has been made in the areas of property rights, recognition of cultural heterogeneity through adoption of bilingual or bicultural education, and promotion and recognition of indigenous organizational forms. It was recommended that gains be consolidated and that approaches to development take into account the knowledge and needs of indigenous people.

Indigenous peoples have a large stake in the use of natural resources. Many of the important natural resources in Latin America are located in areas traditionally inhabited by indigenous people, and it is increasingly recognized that they are among the most efficient custodians of these resources. The direct participation of indigenous people in the management of natural resources therefore can provide often quite sophisticated knowledge of the resource base and how it can be used in a sustainable fashion. The Natural Resource Management Projects in Paraguay and Colombia and the Project to Conserve the Brazilian Rain Forest have all drawn organizations of indigenous people into project design and implementation.

Policies that alleviate poverty among indigenous peoples can also remove pressure on natural resources, yielding both sustainable development and resource protection. The Bank's lending operations to reduce poverty increasingly target indigenous populations in pilot operations to decentralize administration and permit local organizations to participate in social investment funds. Following similar efforts in Bolivia, Honduras, Mexico, Nicaragua and Guatemala, this strategy was extended in fiscal 1994 to Ecuador (Third social Development Fund Project) and Peru (Social Development Fund).

Resettling people displaced by projects

Efforts are under way not only to enhance the positive social benefits of development, but to avoid, minimize or reverse the negative impacts that projects might have, such as the need to displace people. Where resettlement is necessary—for example, for generation of electricity, or roads—the objective is to restore social and economic productivity and to improve the standard of living of those displaced. These resettlement objectives are being realized in several major operations, including the Water Quality Pollution Control Projects and the Itaparica Resettlement and Irrigation Project in Brazil, the Hydroelectric Project in Mexico, and the Yacyretá II Project in Argentina.

In several projects the need to displace people has been avoided altogether or reduced. For instance, the Brazil Espírito Santo Water and Coastal Pollution Project (discussed earlier) was modified during preappraisal to change the siting of a water treatment facility that would have destroyed the clay deposits used by local artisans (or *paneleiras*) in making cooking vessels

and would have forced them to relocate. Instead, the project located a new clay deposit nearby and the need for displacement was eliminated. The Colombia Santa Fé Water Supply and Sewerage Project was expected to displace 400 families, but redesign of the project at appraisal reduced the number to about 80. The São Paulo Integrated Urban Transport Project was able to reduce required displacement from more than 200 families to only 35 families by redesigning the maintenance yard.

A review of resettlement experience was prepared by the Social Policy and Resettlement Division of the central Environment Department of the Bank in 1994. A major conclusion of the review is that, where displacement has been unavoidable, borrower governments are increasingly successful at ensuring that the economic and social well-being of those displaced will be at least restored and that they will be beneficiaries, not victims, of development.

Preserving cultural heritage

Countries are increasingly aware of the value of preserving their cultural heritage. As a result, Bank work in the area of cultural heritage has expanded and now encompasses policy development, operational support, training and international coordination. NEAPs prepared for several countries, including Mexico, contain important cultural heritage policy initiatives and formal training on conservation of cultural heritage. The Bank is establishing a formal cultural heritage conservation program that focuses on the preservation of historic urban environments, the economic valuation of heritage, social assessment and cultural heritage conservation, site management, and the incorporation of cultural property concerns into NEAPs. The Bank's Cultural Property Policy (OPN 11.03) regulates the protection and salvage (as needed) of archaeological and historical sites in Bank-supported projects.

Building on the positive synergies between development and the environment

It is now widely agreed that environmental pressures are often aggravated by persistent poverty and economic policies that encourage the overexploitation or waste of natural resources. The converse also appears to be true: reducing poverty and strengthening human development tend to support environmentally sustainable programs. Policies that promote the efficient use of resources likewise benefit both the environment and the economy in a variety of ways. This section discusses how these dynamics are being addressed by Bank work in Latin America and the Caribbean.

Supporting poverty alleviation

Because poverty reduction, population growth, and environmental stewardship are strongly interrelated, improved primary health care, education, family planning, sanitation, water supply and rural development are central elements in any strategy for sustainable development. In addition, allocating property rights to poor people has a demonstrably positive impact on rural and urban development.

Improving the human environment ultimately means the alleviation of poverty and the extreme pressure on natural and manmade resources associated with it. Natural resource management similarly has an effect on poverty. Many of the most important ecological zones in Latin America and the Caribbean, such as the intact tropical forests and wetlands are found in remote rural areas populated by the extremely poor. Their poverty

places intense pressure on precisely those resources most scarce and valuable, and reducing poverty becomes an important way to protect these resources.

In pursuit of the overarching objective of poverty alleviation, the Bank has been active during fiscal 1994 in all of the areas described here. For example, each of these rural development projects are aimed at the twin goals of poverty alleviation and enhanced environmental management—the Bolivia Eastern Lowlands Project, Colombia Natural Resources Management Project, Paraguay Natural Resources Management Project, and Brazil Mato Grosso Project.

Encouraging the efficient use of resources

Although it is generally appreciated that using resources efficiently benefits both the environment and the economy, many governments still inadvertently encourage the consumption of certain vital resources through subsidies and other policies. Energy, water, wood and pesticides, for example, are often used inefficiently because government subsidies artificially reduce their cost. Subsidies for water, fertilizers and pesticides particularly can encourage excessive and inappropriate use. Subsidized power not only encourages excessive energy consumption but also can divert scarce resources to construction of unnecessary new capacity. Subsidies for fuels encourage overuse as well. Low-priced irrigation water encourages waste and overuse that can lead to salinization or waterlogging. Cheap credit can encourage conversion of forest areas into cattle ranches on soils that often cannot sustain them.

Production of energy often has severe environmental consequences: flooding from large dams, air pollution and global warming from burning of carbon-based fuels, and damage to land, forests and water from extraction of energy sources. Meeting energy requirements in an environmentally sound manner requires improved efficiency of production and use of energy resources and promotion of resource conservation. Policies that encourage efficiency lead to less waste, less consumption of raw materials, and more technological innovation.

Reduction or elimination of subsidies to bring about more efficient use of resources and achieve environmental objectives is a major component in Bank-supported water supply and pollution control projects, for example, in Brazil and Mexico. Irrigation projects in Chile and Colombia include

pricing strategies for recovering maintenance costs and part of the investment costs.

Increasing the use of market-based incentives

As part of the effort to improve environmental conditions in a cost-effective manner, Latin American countries, either on their own or with assistance and encouragement of the Bank, have begun to explore the use of market-based incentives (MBI). Environmental externalities in production or consumption can lead to market failures that justify government intervention on environmental grounds. Traditionally, this intervention has taken a command and control or regulatory approach; that is, environmental standards are set by legislation and are enforced by environmental protection agencies, and noncompliance results in fines or other sanctions. An alternative is to use MBIs—charges, taxes (sometimes called "green taxes"), subsidies, tradeable permits, and noncompliance fees—that reflect environmental pollution costs and benefits and encourage producers and consumers toward more efficient use of the environmental goods and services.

The Bank encourages the use of MBIs to signal the true cost of environmental degradation and depletion of natural resources. By properly pricing the use of water, land, minerals, forests and marine resources, incentives for improved management are increased; by charging for sewage collection and treatment, solid waste collection and hazardous waste disposal, the fuller recovery of costs can be achieved; by taxing pesticides, fuels, ozone depleting substances and the use of non-biodegradable objects, the incentives to use them are reduced and the prospected for recycling are improved.

A preliminary review in Jamaica and Belize, carried out by the Environment Unit of the Latin America and Caribbean Region, indicated that governments already have legal and administrative frameworks in place for environmental tax management. However, taxes to reduce environmental degradation are generally weakly implemented for a variety of reasons, including unclear responsibility for collection and use and opposition from user groups. The Brazil Infrastructure and Urban Development/Water Supply and Sanitation Project offers a good example of this trend in environmental policy. One of the main components of the project is the support of MBI studies for controlling the settlement of sensitive areas and

ensuring that consumers pay a price for water that reflects the costs imposed on the natural environment.

Environmental policy cannot be based entirely on the use of MBIs, but they do have several advantages over command and control type measures. These include welfare gains, lower costs of implementation, and greater flexibility for polluters to adjust to new environmental concerns. A combination of command and control measures and MBIs may be the most effective way of dealing with environmental degradation.

Although there may be conflicts between environmental objectives and narrower economic goals, in many cases policy change yields both economic and environmental benefits. Market-based policies tax or otherwise raise the cost of harmful activities and reward environmentally sound activities. In addition, MBIs induce technological innovations that lead to cleaner production techniques.

Encouraging sector and economywide adjustment

Policies that encourage foreign investment and trade can lead to industrial development that increases pollution—but increased openness can also set in motion processes that reduce pollution as well. In Chile, for example, the openness of the economy has brought cleaner industrial processes. The absence of barriers to foreign investment and the import of technology has exposed domestic firms to foreign competitors who use home-country production processes that are cleaner and often more efficient than domestic ones. If the cleaner multinational firms have higher costs than domestic competitors, they tend to try to improve their competitive position not by lowering their environmental standards but by encouraging the government to introduce or raise standards that force the domestic firms to compete on an equal footing with foreign-owned firms.

Some critics of structural adjustment loans have focused on the potential negative environmental impact of this type of lending. However, in El Salvador, for example, the incorporation of environmental policy into the reform agenda has elevated the discussion of environmental issues to the highest policymaking and political circles. The government requested that three items be included in the set of development objectives supported by the Second Structural Adjustment Loan: (a) proposals for reform of the institutional framework for environmental management; (b) development of an environmental action plan for addressing the most pressing

Box 16. Environmentally sound agricultural sector adjustment in Honduras

A $60-million credit, approved in September 1993, supports the government's medium-term Agricultural Sector Modernization and Development Program. The primary objectives of the program are increased economic efficiency and growth of the sector through reforms in price and trade policies, credit subsidies, and regulations and legislation related to land use and forestry. A second, but important, objective is to improve the management of land and forest resources largely through the implementation of new laws and regulations that are believed to create "win-win" situations—that is, improve economic efficiency and environmental management at the same time.

These policies include removal of subsidized credit for agriculture; improvement of land tenure, particularly for women and farmers owning less than 5 hectares; rationalization of land expropriation policies to alleviate distortions in land use patterns; and the return to more nearly free markets in the forest sector. It is believed that free markets would lead to higher prices and, in turn, more intensive management, reforestation, and greater efficiency (less waste) in both harvesting and milling.

Actions to induce free market conditions involve removing the government's legal monopoly over forest resources (that is, returning ownership of timber resources to private landowners); terminating contracts with forest industries on both private and public lands (which included low stumpage fees and short-term extraction permits); removing the public sector from, and allowing the private sector into, forest production, industrialization and marketing; and instituting public bidding or auctions for the sale of state-owned wood resources.

Experience in other countries with regulations requiring forest management plans before utilization indicate that without intensive monitoring and a willingness to impose sanctions and penalties sufficient to act as a deterrent, plans can be ignored. Monitoring and enforcement of regulations also requires sufficient trained staff. Regulations that will be implemented include: (a) zoning of lands to forestry potential where conversion to agriculture is or was not appropriate; (b) exemption of private forest lands from expropriation, and state forest lands from adjudication, under land reform (that is, title will not be granted for lands deemed suitable only for forestry but instead usufruct rights may be given to communities); (c) requirement that management plans conform to certain rules and regulations before forest utilization; (d) strengthening of the system of parks and protected areas; and (e) stringent monitoring and enforcement of compliance with regulations.

Environmental benefits should flow from the change of the incentive structure for forested lands. Since the government previously captured essentially all of the rents from forested land, and forested lands were more likely to be expropriated, the incentive was to transform these lands to some other use. Under the new policy regime, some economic incentives to clear forest may remain, but regulations that provide disincentives to preserving forest cover will be eased.

This program is attempting to influence land use through zoning combined with incentives and disincentives. For example, project titling rights are based on land use potential, which provides a disincentive to occupying lands that should remain in forest, or at least should skew occupation toward agricultural lands. This disincentive to occupy forest lands may not be sufficient to stem migration and occupation, however, if there are not adequate alternatives (either economic or land).

environmental issues; and (c) development of a comprehensive environmental law for submission to the national assembly. In only about a year and a half, the government had completed the preparatory analysis leading to the institutional changes and had drafted documents supporting these goals. The significance of these changes and the speed with which they were undertaken signal the possible complementarity between structural adjustment and the environment. (See box 16 for another example of the positive environmental impacts from structural adjustment lending, in this case in the agriculture sector of Honduras.)

Support for regional economic integration

The World Bank supports efforts at regionalization that reduce trade barriers and encourage more efficient use of resources. At times, integration has environmental implications, and differing environmental standards between countries can be a cause of concern. It is sometimes argued that the countries with lower standards will have lower costs that attract dirtier industries. This was an argument of opponents of the North American

Box 17. Support for NAFTA through improvements in environment conditions

The 3,300-kilometer boundary between Mexico and the United States is highly industrialized. A large part of the area is arid or semi-arid, although there are some forested areas and irrigated farmlands. The population of the major cities along the border has grown dramatically, attracted by rapid industrial expansion. Pressing environmental problems include overstretched urban services, such as absence of adequate water supply and sanitation, a shortage of safe facilities for management and disposal of solid waste, severe air pollution from cars and trucks moving on unpaved roads, and industrial waste, much of it hazardous. There is also pressure on the natural environment from growing built-up areas and increasing agricultural activities that threaten rich endemic biodiversity. The Mexico Northern Border Environmental project will (a) assist municipal, state and federal authorities to strengthen environmental planning, management and enforcement capabilities; and (b) help finance priority investments and action plans designed to preserve the environment, reverse past environmental degradation, and reduce health risks.

In addition, the Second Solid Waste Project and the Second Water Supply Project will significantly reduce the environmental impact in these sectors throughout the country. The former includes a retraining and education program for people who subsist by scavenging in open dumps. It is hoped that this will allow scavengers to find alternate employment or at least reduce the health risks for those who continue this hazardous activity.

Free Trade Agreement (NAFTA), for instance. Moreover, it is argued such industries will locate in convenient border areas and the negative effects on air and water quality will spill across borders. To support Mexico's obligations under NAFTA, the Bank's Latin America and Caribbean Region signed a protocol agreement with the government pledging $1.8 billion in environmental loans over the next three years. The first fruits of this are the 1994 Mexico Water and Sanitation Project, the Second Solid Waste Project, and the Northern Border Environment Project (see box 17).

Meeting global environmental challenges

Some problems, such as acid rain and the pollution and sedimentation of international rivers are regional in scope, but others are global in dimensions. Global environmental deterioration by definition affects all countries. There are four major areas of global concern: (a) loss of biodiversity as a consequence of deforestation and other destruction of natural habitats; (b) global climate change as a result of the accumulation in the atmosphere of gases (formed in the burning of hydrocarbons) that trap heat; (c) pollution of international waters, loss of marine life, and destruction of coral reefs by oil spills, waste dumping, and other undesirable activities in international waters; and (d) emission of chlorofluorocarbons (CFCs) and destruction of the ozone layer. The Global Environmental Facility (GEF) provides grants and concessional funding to developing countries for projects and programs aimed at protecting the global environment. It has been very effective in integrating global environmental concerns into national development goals. Thus far, 24 percent of GEF funds have been allocated for projects in Latin America and the Caribbean (see box 18).

The World Bank administers GEF projects. Nine projects in Latin America and the Caribbean have been included in the first four tranches of the GEF: Mexico Biodiversity and Bolivia Biodiversity are being implemented, and Peru Biodiversity and Ecuador Biodiversity have just begun (see box 19); the remainder—Mexico High Efficiency Lighting, Brazil Biodiversity, the Organization of Eastern Caribbean States (OECS) Solid Waste Management,

Box 18. The GEF program in the Caribbean

Two initiatives are under way with GEF support to address ship waste disposal problems in the Caribbean. Due to differences in project activities and objectives, the institutional and implementation arrangements for the two projects differ. The objective of the Wider Caribbean Initiative for Ship Waste is to develop a coordinated strategy for the twenty-nine countries that constitute the Wider Caribbean (WC) for ratifying MARPOL. This involves assessing the status of the legal and regulatory frameworks in the WC countries to determine changes required, identify potential waste disposal sites throughout the WC, plan an optimal siting strategy, and recommend modifications that might be required for effective management of ship waste. Given the need for a coordinated approach across countries and development of a regional strategy, the countries opted for a regional project coordinated by the International Maritime Organization, in close coordination with national authorities.

In contrast, the proposed OECS Waste Disposal Project, covering six members of the OECS, has been developed as a regional initiative, but will be implemented with financial and technical assistance provided by GEF grants and associated loans or credits by the IBRD, IDA, European Investment Bank (EIB), and Caribbean Development Bank (CDB). The implementation approach is most appropriate to participating OECS countries because they are in the process of ratifying MARPOL, and project funding will primarily support country-specific investments. Where funding supports implementation of a regional component (such as for monitoring and evaluation or preparation of a regional sewerage strategy), the recipient countries have agreed they will each contribute their share of funding to a special project unit managed by the OECS Secretariat. Thus, implementation arrangements comprise national and regional elements within the same project.

and Costa Rica Wind Electric Power—are either being appraised or are in preparation. Three other projects are being prepared for the fifth and subsequent tranches: Wider Caribbean Initiative for Disposal of Ship-Generated Waste, Jamaica Energy Demand-Side Management, and Brazil Biomass Gasification/Gas Turbine. A pilot program to protect the Brazilian rain forests is also under way (as described in box 10).

The Bank supports national efforts toward biodiversity conservation through biodiversity projects and components in GEF and G-7 grants, as well as regular Bank/IDA lending; improved environmental assessment of projects to avoid serious biodiversity damage; sector work to identify priorities; and incorporation of biodiversity concerns into the general policy dialogue on broader natural resource management issues. The Bank also participates actively in the Biodiversity and Climate Change Conventions and in the implementation of the Desertification Convention.

GEF projects support land management efforts in all major biomes, with emphasis on conservation and sustainable use. During the course of the pilot phase, several cross-cutting issues have emerged: the central importance of engaging local communities and indigenous peoples as partners and stakeholders in designing and implementing projects, the need for a stable supply of recurrent cost financing, and the development of local capacity to identify and sustain externally funded initiatives in line with national priorities and development plans. Community participation is a central tenet of GEF's biodiversity portfolio. The Bolivia Biodiversity Conservation Project, for instance, supports the development of an integrated plan for managing Bolivia's protected areas system and involves local, indigenous communities, and institutions in the management of resources within the protected areas. The project seeks, in part, to help convert some "paper parks" into functional units and includes training to enable the local communities to assume increased responsibility for managing them.

Biodiversity components of projects can be designed to minimize or compensate for project-related loss of natural habitats, in accordance with

Box 19. Focus on biodiversity in Ecuador through GEF project

The Ecuador Biodiversity Conservation Project, approved in fiscal 1994, is supported by the GEF. It is designed to strengthen the legal and regulatory systems for protected areas and the main agency responsible for managing them; to provide community outreach activities; and to develop protection and conservation infrastructure in eight priority protected areas. A new government entity, INEFAN, was created to manage the forests and the national parks system. Project preparation was carried out with active participation by local NGOs. Several stakeholder workshops were held to identify critical sites and major issues. Institutional arrangements for managing the eight priority sites include NGOs, the private sector, joint NGO-village cooperation, as well as indigenous peoples (with some state support). Consultation with NGOs has been a central feature in developing the project and selecting activities for funding. During project implementation, activities in and around the eight areas will be determined by Regional Coordinating Committees (RCCs). RCCs, which will be composed of representatives of local communities, indigenous peoples, local NGOs and INEFAN, will be responsible for formulating and approving the management plan for each pertinent protected area. In addition, RCCs will provide a forum for discussing natural resource use and shaping project activities through approval of management plans. Local communities in and around protected areas will also be able to receive technical advice on natural resource use choices facing their community and how to deal with complex legal questions related to land tenure, land use planning, and negotiations with resource extraction companies.

the Bank's Operational Policy 4.04 (formerly the Wildlands Policy). Such biodiversity components were designed for Ecuador's Lower Guayas Flood Control Project (for improved management of the Manglares Churue Ecological Reserve), Bolivia's Eastern Lowlands Project (improved management of the Amboro and Noel Kempff Mercado National Parks), Chile's Pehuenche Hydroelectric Project (intensive management of the threatened Burrowing Parrot), St. Lucia's Water Supply Project (protection of about 1,500 hectares for the forest watershed and compensation for the flooding of about 25 hectares), and Brazil's Minas Gerais Forestry Project (improved management of the Rio Dôce State Park and other protected areas). As discussed previously, other Bank-funded projects support the establishment or strengthening of protected areas, even when compensation for natural habitat loss is not an issue.

The GEF is also supporting research on biodiversity in Central America and an assessment of greenhouse gases in Mexico. Both studies were initiated this year. The Bank has undertaken a major study of regional priorities for conservation of biodiversity to assist governments in setting priorities and designing projects, possibly for financing by the GEF.

Projects to promote renewable energy and conserve energy have also been supported by the GEF and administered by the Bank. A GEF-supported High Efficiency Lighting Project in Mexico was approved in fiscal 1994. The project will provide subsidies for the distribution of high-efficiency light bulbs in several metropolitan areas. A monitoring and evaluation system has been put in place to measure the resultant energy savings. A Demand Side Management Project for Jamaica is also being supported by the GEF. It is designed to achieve energy savings in the commercial sector through a pilot program involving solar water heating, exploration of the possibilities for cogeneration in large buildings such as hotels, and development of capacity in monitoring and evaluation.

Mexico's Air Quality Management Project should greatly reduce emissions of greenhouse gases and ozone-depleting substances from cars and other vehicles in Mexico City's metropolitan area. Mexico is also testing the potential of tradeable emission permits. The first country to ratify the Montreal Protocol, Mexico plans to phase out CFC production twice as fast as the agreed-upon schedule for developing countries.

Ozone, a bluish gas with a penetrating smell, forms a natural layer at an altitude of 25 kilometers in the earth's atmosphere. This ozone layer acts as a filter for the sun's hazardous ultraviolet rays and undergoes a natural cycle of thinning and regeneration. Scientists have compiled evidence

indicating that the thinning has been increasing since 1974, allowing a higher level of ultraviolet radiation to penetrate the ozone layer. This presents a real danger: ultraviolet radiation not only burns the skin and increases the incidence of skin cancer but also can cause eye cataracts, destroy plankton, and increase pollution and is thought to contribute to climate change. The increase in the deterioration of the ozone layer has occurred due to the emission of CFCs used, among other things, as the propellent for aerosol products and a refrigerant for air conditioners and refrigerators. Scientists have stated that one chlorine atom can destroy ten thousand ozone molecules before becoming neutralized.

The Montreal Protocol was established in September 1987 by twenty-four nations to promote the reduction and substitution of the use of substances that deplete the ozone layer. Today, more than seventy nations have ratified the Protocol. In June 1990 a Multilateral Fund was established to assist developing countries who are signatories of the Protocol in their efforts to reduce and eliminate ozone-depleting compounds. The Bank is one of the implementing agencies of the Protocol. The others include the United Nations Environment Programme, the United Nations Development Programme, and other appropriate agencies depending on their respective area of expertise. The Bank assists in administering and managing the program that finances agreed costs of activities needed to comply with the Protocol.

Countries wishing to receive support from the Multilateral Fund are required to develop a country program (CP) and projects in accordance with terms of reference of the executive committee. The country program contains a description of production, use and applications of controlled substances; the institutional, policy and regulatory framework governing controlled substances; a statement of strategy for implementation of the Protocol; an action plan including investment and technical assistance projects; a timetable for each activity of the action plan; and a budget and financing program for all proposed activities.

The Bank assists member countries in preparing country programs and in preparing grant requests for institutional strengthening, training, and investment projects designed to phase out ozone-depleting substances (ODS) in subsectors such as aerosols, refrigeration, foams, and cleaning solvents (see annex 4 for list of projects). Country programs have already been approved for Chile, Ecuador, Mexico, and Uruguay. Drafts have now been completed with UNDP/UNEP assistance for Argentina, Brazil, Guatemala and Venezuela.

The road ahead

The nature and scope of environmental activities in both the World Bank and the countries of Latin America and the Caribbean have undergone a remarkable transformation in less than a decade. In the not-so-distant past, the environmental implications of development were either ignored or dealt with in a superficial manner. The relatively low priority given to the environment in most cases accurately reflected public opinion that at the time tended to focus on such pressing issues as the debt crisis and macroeconomic adjustment. Today, paralleling the wave of democratization and resumption of economic growth in much of the region, environmental issues have moved to the forefront of the development agenda. Many countries are now working diligently to clean up environmental problems created in the past while at the same time taking steps to prevent their reoccurrence in the future. The World Bank is proud to be a partner in this process.

A good start has been made in the region, but there is much more to be done. The responsibility for ensuring future environmental progress clearly rests with the countries themselves. At a minimum, continued progress will require a long-term and unflagging commitment to the concept of sustainable development on the part of government and the private sector alike. The principal role of the World Bank will continue to be to support the efforts of countries through lending and technical assistance. In many countries, this help will probably take the form of freestanding environmental projects in support of institution building and various policy reforms, at least initially. In all countries, the Bank will work with public and private sector entities

to ensure that more traditional development projects are designed to maximize their environmental and social net benefits. Finally, the World Bank will assist the countries by identifying and disseminating "best environmental practices" through conferences, seminars and workshops in the region, and through developing new methodologies for analyzing environmental issues of importance to Latin America and the Caribbean.

Notes

1. This overview of Bank environmental work in fiscal 1994 is excerpted from a draft 1994 annual report on the environment, *Making Development Sustainable*, produced by the central Environment Department, The World Bank.

2. *Dollars* in this report are U.S. dollars unless otherwise specified.

3. The International Development Association (IDA) is the part of the World Bank Group that lends to the poorest countries at very low interest rates. The International Bank for Reconstruction and Development (IBRD), usually referred to as the World Bank, lends to other developing countries at near-market rates.

4. In October 1991 OD 4.01 replaced the original directive on environmental assessment OD 4.00, Annex A, issued in October 1989.

5. The new system of policy statements for Bank work, the Operational Policies (OPs), has been in force since January 1993. These OPs replace the previous system of Operational Directives (ODs), which replaced the systems of Operational Manual Statements (OMSs) and Operational Policy Notes (OPNs). Until policies are revised, the most recent statement under a previous system is in force.

6. *EA Sourcebook Update: Privatization and Environmental Assessment* (no. 6, March 1994), is available from the Land, Water and Natural Habitats Division of the central Environment Department, The World Bank.

Annex 1: Projects with environmental components, fiscal 1994

(approved as of May 31, 1994)

Country	Project	EA cat.	Total cost (US$)	Loan/ cred. amt. (US$)	Maj/ min. env. comp.	Environmental component
Bolivia	Municipal Sector Development Project (Cr. 2565-BO	B	56.0	42.0	Minor	Urban Environmental Management Urban Policy/Regulatory Reform Natural Disaster Prevention
Brazil	State Highway Management II Project States of Maranhão, Piauí, and Tocantins (Lns. 3713, 3714, 3715-BR)	B	602.8	220.0	Major	Environmental Institution Strengthening Environmental Policy/Regulatory Reform
Colombia	Natural Resource Management Project (Ln. 3692-CO)	B	63.4	39.0	Major	Forest Resource Management Water Basin Rehabilitation and Protection Parklands Management Environmental Education
Ecuador	T.A. Mining (Ln. 3655-EC)	A	24.0	14.0	Major	Hazardous Waste Management Sectoral Reform/Restructuring Environmental Policy/Regulatory Reform
	Third Social Development Fund Project (ln. 3707-EC)	B	73.5	30.0	Minor	Poverty Alleviation
Guyana	Water/Sewerage T.A. Project (Cr. 2559-GUA)	B	28.6	17.5	Minor	Sectoral Institution Strengthening
Honduras	Agricultural Sector Adjustment Project (Cr. 2540-HO)	B	99.9	27.9	Major	Forestry Sector Policy/Regulatory Reform Forest Resource Management Land Titling and Registration
Mexico	On-Farm & Minor Irrigation Networks Project (Ln. 3722-ME)	B	568.8	200.0	Minor	Water Resource Management Environmental Policy Monitoring and Enforcement

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Annex 1 *(continued)*

Country	Project	EA cat.	Total cost (US$)	Loan/ cred. amt. (US$)	Maj/ min. env. comp.	Environmental component
Nicaragua	Agricultural Technology & Land Management Project (Cr. 2536-NI)	B		44.0	Minor	Water Resource Management Soil Conservation Land Titling and Registration
Panama	Roads Rehabilitation Project (Ln. 3686-PAN)	B	406.0	60.0	Major	Environmental Institution Strengthening Sectoral Environmental Policy Reform Special Environmental Problem Studies Environmental Management Training
Paraguay	Highways VIII Project (Ln. 3685-PA)	B	90.0	65.0	Major	Urban Traffic Congestion Abatement
	Natural Resource Management Project (Ln. 3708-PA)	A	79.1	50.0	Major	Natural Areas Protection Indigenous Communities Protection Land Titling and Registration
Peru	Transport Rehabilitation Project (Ln. 3717-PE)	B	242.0	150.0	Major	Environmental Impact Mitigation
	Social Development Fund (Ln. 3684-PE)	B	497.0	100.0	Minor	Poverty Alleviation
Uruguay	Natural Resource Management Project (Ln. 3708-UR)	A	80.0	150.0	Major	Natural Resource Management Soil Conservation Natural Areas Protection
Venezuela	Urban Transportation Project (Ln. 3657-VE)	B	300.0	100.0	Major	Sectoral Institution Strengthening Sectoral Environmental Institution Development Urban Traffic Congestion Abatement

Note: Environment categories (A,B, or C) are assigned according to guidance provided in the Bank's Operational Directive 4.01 *Environment Assessment.*

Annex 2: Projects under implementation with environmental components, fiscal 1987–93

Country	Ln/cr. no.	Project	FY	EA cat.	Ln/cr. amt.	Environmental component
Argentina	2970-AR	Agricultural Credit II	88	NR	106.5	Sectoral Modernization Soil Conservation
	2998-AR	Power Sector I–Yacyretá	89	NR	252.0	Sectoral Planning Studies
	3297-AR	Agricultural Services & Institutional Development	91	B	33.5	Sectoral Modernization
	3291-AR	Public Enterprise Reform Adjustment Loan	91	B	300.0	Institutional Reform/Restructuring
	3292-AR	Public Enterprise Reform Execution Loan (PEREL)	91	B	23.0	Institutional Reform/Restructuring
	3281-AR	Water Supply & Sewerage Sector Loan	91	B	100.0	Sectoral Institution Strengthening Water Supply/Sewerage Expansion
	3416-AR	Hydrocarbon Sector Engineering	92	B	28.0	Sectoral Policy/Regulatory Reform
	3520-AR	Second Yacyretá Hydroelectric Project	93	A	300.0	Natural Areas Protection Water Supply/Sewerage Expansion Resettlement of Displaced Peoples
Bolivia	2013-BO	Mining Sector Rehabilitation	89	B	35.0	Sectoral Institution Strengthening
	2119-BO	Eastern Lowlands Natural Resource Management & Agricultural Production Project	90	B	35.0	Natural Resource Management Indigenous Communities Protection
	2216-BO	Agricultural Technology Development	91	B	21.0	Sectoral Modernization Appropriate Technology Development
	2187-BO	Major Cities Water & Sewerage Rehabilitation	91	B	35.0	Sectoral Policy/Regulatory Reform Sectoral Institution Strengthening Water Supply/Sewerage Expansion

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	In/cr. amt.	Environmental component
Bolivia *(continued)*	2322-BO	Agro Export Development Program	92	B	22.5	Sectoral Modernization Appropriate Technology Development
	3443-BO	Environmental Technical Assistance Project	93	C	4.8	Environmental Institution Strengthening Environmental Policy/Regulatory Reform Environmental Education
Brazil	2831-BR	Second Industrial Pollution Control	87	NR	50.0	Industrial Pollution Control Environmental Institution Strengthening Industrial Pollution Abatement Strategies
	2895-BR	Minas Gerais Forestry Development Project	88	NR	48.5	Forest Resource Management Natural Areas Protection Environmental Institution Strengthening Environmental Education
	2950-BR	Irrigation Subsector I–A	88	NR	195.0	Environmental Policy/Regulatory Reform
	2971-BR	Agricultural Credit	88	NR	300.0	Sectoral Financing Reform
	2975-BR	Rio Flood Reconstruction and Prevention	88	NR	175.0	Natural Disaster Prevention Hillside Stabilization Flood Control and Urban Drainage Improvement
	2883-BR	Resettlement and Irrigation - Itaparica	88	NR	232.0	Resettlement of Displaced Peoples
	3018-BR	Land Management I–Paraná	89	NR	63.0	Sustainable Land Management Soil Conservation Forest Resource Management
	3160-BR	Land Management II–Santa Catarina	90	B	33.0	Sustainable Land Management Soil Conservation Forestry Resource Management
	3173-BR	National Environment	90	B	117.0	Natural Areas Protection Natural Resource Management Environmental Institution Strengthening Environmental Policy/Regulatory Reform

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	In/cr. amt.	Environmental component
Brazil *(continued)*	3376-BR	Hydrocarbon Transport & Processing	91	A	260.0	Sectoral Reform/Restructuring Industrial Accident Prevention
	3269-BR	Science Research & Training	91	C	150.0	Environmental Research and Training Programs
	3444-BR	Rondônia Natural Resource Management	92	B	167.0	State Environmental Policy/ Regulatory Reform Urban Nature Parks Development Biodiversity Conservation Sustainable Forest Agriculture and Agroforestry
	3492-BR	Mato Grosso Natural Resource Management	92	B	205.0	Environmental Policy/Regulatory Reform Environmental Institution Strengthening Biodiversity Conservation Sustainable Agroforestry and Agroecological Zoning
	3442-BR	Water Sector Modernization	92	B	250.0	Sectoral Policy/Regulatory Reform Water Supply/Sewerage Expansion
	3480-BR	National Industrial Pollution Control	92	C	50.0	Industrial Pollution Control Environmental Institution Strengthening Industrial Pollution Abatement Strategies
	3457-BR	São Paulo Metropolitan Transport Decentralization	92	B	126.0	Sectoral Policy/Regulatory Reform Sectoral Institution Strengthening
	3547/8-BR	State Highway Management Project	93	B	88.0	Sectoral Policy/Regulatory Reform Sectoral Institution Strengthening
	3554-BR	Minas Gerais Water Quality and Pollution Control Project	93	A	145.0	Flood Control and Urban Drainage Improvement Wastewater Collection and Treatment Solid Waste Management Water Basin Management

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	ln/cr. amt.	Environmental component
Brazil *(continued)*	3503 /4/5-BR	Water Quality and Pollution Control Project–São Paulo/ Paraná	93	A	245.0	Sectoral Institutional Development Water Basin Management Wastewater Collection and Treatment
	3633-BR	Rio de Janeiro Metropolitan Transport Decentralization Project	93	B	128.5	Enterprise Reform/Restructuring Sectoral Institution Strengthening
Chile	2832-CH	Pehuenche Hydroelectric Project & Alto Jahuel–Polpaico Transmission Project	87	NR	50.5	Endangered Species Protection Resettlement Studies
	3331-CH	Second Valparaíso Water Supply & Sewerage	91	B	50.0	Water Supply/Sewerage Expansion Sectoral Institution Strengthening
	3426-CH	Transport Infrastructure Sector	92	B	71.0	Sectoral Policy/Regulatory Reform Industrial Accident Prevention Solid Waste Management
	3528-CH	Irrigation Development Project	93	A	45.0	Water Resource Management Sectoral Institution Strengthening
	3529-CH	Environmental Institutions Development Project	93	C	11.5	Environmental Institution Development Environmental Policy/Regulatory Reform Natural Resource Management
Colombia	2829-CO	Second National Highways Sector Project	87	NR	180.3	Sectoral Institutional Strengthening Sectoral Policy/Regulatory Reform
	2889-CO	Power Sector Adjustment Loan	88	NR	300.0	Sectoral Policy/Regulatory Reform
	3113-CO	Small-Scale Irrigation Project	90	B	78.2	Water Resource Management

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	ln/cr. amt.	Environmental component
Colombia *(continued)*	3157-CO	Second Rural Roads Project	90	B	55.0	Preparation of Environmental Studies
	3321-CO	Industrial Restructuring & Development	91	B	200.0	Environmental Institutional Development
	3453-CO	Third National Roads Sector	92	B	266.0	Environmental Institutional Development Environmental Management Training
Costa Rica	2764-CR	Agricultural Sector Investment & Institutional Development	92	B	26.0	Sectoral Policy/Regulatory Reform Sectoral Institutional Strengthening
Ecuador	3276-EC	Lower Guayas Flood Control	91	A	59.0	Natural Areas Protection
	3390-EC	Rural Development	92	B	84.0	Aforestation Natural Resource Management
El Salvador	3389-ES	Power TAL	92	B	11.0	Sectoral Institution Strengthening Environmental Impact Assessment Training
	3576-ES	Agricultural Sector Reform and Investment Project	93	B	40.0	Sectoral Reform/Restructuring Sectoral Institution Strengthening
Honduras	2991-HO	Fourth Agricultural Credit	89	NR	25.0	Sectoral Policy/Regulatory Reform Land Titling and Registration Natural Resource Management
Jamaica	3275-JM	Road Planning & Maintenance	91	B	35.0	Environmental Impact Assessment Training
	3502-JM	Energy Sector Deregularization	93	A	60.0	Sectoral Environmental Strategy
Mexico	3083-ME	Hydroelectric Development	89	NR	460.0	Sectoral Policy/Regulatory Reform Environmental Institution Strengthening
	3115-ME	Forestry Development Project	90	B	45.5	Natural Resource Management Natural Areas Protection

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	In/cr. amt.	Environmental component
Mexico *(continued)*	3310-ME	Decentralization & Regional Development	91	B	350.0	Natural Areas Protection Environmental Institution Strengthening
	3419-ME	Irrigation & Drainage Sector	92	B	400.0	Sectoral Institution Strengthening Water Resource Management Sustainable Land Management
	3461-ME	Environmental Project	92	C	50.0	Environmental Institution Strengthening Sectoral Institution Strengthening Environmental Policy/Regulatory Reform Biodiversity Conservation Industrial Pollution Control
	3559-ME	Medium-Size Cities Urban Transport Project	93	B	200.0	Sectoral Institution Strengthening Environmental Management Training
	3543-ME	Transport Air Quality Management Project	93	C	220.0	Air Pollution Control Environmental Policy/Regulatory Reform Environmental Institution Strengthening
Paraguay	3440-PA	Land Use Rationalization	92	B	29.0	Environmental Institution Strengthening Environmental Management Studies
	3519-PA	Third Rural Water Supply and Sanitation Project	93	B	23.0	Sectoral Policy/Regulatory Reform Sectoral Institution Strengthening
St. Lucia	3184-SL	Water Supply Project	90	B	7.7	Environmental & Health Impact Mitigation
St. Vincent & The Grenadines	3016-SV	Agricultural Rehabilitation and Diversification Project	89	B	2.8	Land Titling/Lease Options to Small Farmers
Trinidad & Tobago	3432-TR	Business Expansion & Industrial Restructuring	92	B	27.0	Environmental Policy/Regulatory Reform Environmental Impact Assessment Training Industrial Pollution Control

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Annex 2 *(continued)*

Country	Ln/cr. no.	Project	FY	EA cat.	In/cr. amt.	Environmental component
Venezuela	3223-VE	Public Enterprise Reform Loan	91	B	350.0	Sectoral Reform/Restructuring
	3495-VE	Low Income Barrios Improvement Project	92	B	40.0	Urban Environmental Management Water Supply/Sewerage Expansion Flood Control and Urban Drainage Improvement Solid Waste Management
	3535-VE	National Parks Management Project	93	C	55.0	Environmental Institutional Strengthening
	3553-VE	Highway Management Project	93	B	150.0	Sectoral Institution Strengthening Environmental Impact Assessment Training

Note: Environment categories (A,B, or C) are assigned according to guidance provided in the Bank's Operational Directive 4.01 *Environment Assessment.* The notation "NR" in this annex table indicates those projects presented to the Board before the issuance of OD 4.01.

Annex 3: Selected World Bank environment-related publications on Latin America and the Caribbean

LAC Technical Department publications

Cambers, Gillian. December 1992. Coastal Zone Management: Case Studies from the Caribbean. Regional Studies Program, Report 26.

Latin America and the Caribbean Regional Office. June 1992. Environment and Development in Latin America and the Caribbean—The Role of the World Bank.

Peuker, Axel. February 1992. Public Policies and Deforestation: A Case Study of Costa Rica. Regional Studies Program, Report 14.

Poole, Peter. August 1989. Developing a Partnership of Indigenous Peoples, Conservationists, and Land Use Planners in Latin America. Working Paper 245.

Schneider, Robert. May 1994. Government and the Economy on the Amazon Frontier. Regional Studies Program, Report 34.

———. May 1992. Brazil: An Analysis of Environmental Problems in the Amazon. Report 9104-BR.

Wali, Alaka, and Shelton Davis. July 1992. Protecting Amerindian Lands: A Review of World Bank Experience with Indigenous Land Regularization in Lowland South America. Regional Studies Program, Report 19.

LAC Environment Unit Dissemination Notes

No. 1 Sustainability, Yield Loss and *Imediatisimo*: Choice of Technique at the Frontier. April 1993. Gunars Platais, David Rosenblatt, Maryla Webb.

No. 2 The Potential for Trade with the Amazon in Greenhouse Gas Reduction. April 1993. Robert Schneider.

No. 3 Land Abandonment, Property Rights, and Agricultural Sustainability in the Amazon. April 1993. Robert Schneider.

No. 4 The Urban Environmental Challenge in Latin America. August 1993. John Dixon.

No. 5 An Analysis of Flooding in the Paraná/Paraguay River Basin. September 1993. Robert J. Anderson, Jr., Nelson da Franco Ribeiro dos Santos, Henry F. Diaz.

No. 6 Ecology and Microeconomics as "Joint Products": The Bonaire Marine Park in the Caribbean. October 1993. John A. Dixon, Louise Fallon Scura, Tom Van't Hof.

No. 7 Forest Management and Competing Land Uses: An Economic Analysis for Costa Rica. October 1993. Nalin M. Kishor, Luis F. Constantino.

No. 8 Pueblos Indígenas y Desarrollo en América Latina. December 1993. Jorge E. Uquillas, Jean-Carlo Rivera.

No. 9 Prospects for Improved Management of Natural Forests in Latin America. December 1993. Robert Kirmse, Luis Constantino, George Guess.

No. 10 Assessing the Conservation Potential and Degree of Threat Among Ecoregions of Latin America and the Caribbean: A Proposed Landscape Ecology Approach (English and Spanish). February 1994. David M. Olson, Eric Dinerstein, (World Wildlife Fund).

Department publications may be requested by writing to: The World Bank, LAC Information Center, Room I-5200, 1818 H Street N.W., Washington DC 20433.

For *Environment Unit Dissemination Notes*, write to: The World Bank, LAC Technical Department, Environment Unit, Room I-8421, 1818 H Street N.W., Washington DC 20433.

Annex 4: GEF-funded projects in Latin America and the Caribbean

Country	Grant Amount ($ millions)	Main project	Subprojects
Brazil	2.9	ODS Phase Out	Refrigeration Maintenance; Recovery/Recycling; Retrofit; and Conversion to HFC-134a
Chile	1.2	ODS Phase Out	Institutional Strengthening; Public Awareness; Ozone Seal; Staff Training
Ecuador	1.6	ODS Phase Out	Training; Institutional Strengthening; CFC phase out in aerosol production, and in foam manufacturing for refrigerators; Recycling/recovery of refrigerant in refrigerator maintenance; and conversion to HCF-134a
Mexico	0.2	Ozone Pilot Recycling	Technical assistance for recycling/ recovery of refrigerant in automobile industry
	4.0	Line of Credit	Recycling/recovery of refrigerant in refrigerator maintenance; conversion to HCF-134a
Venezuela	1.3	ODS Phase Out	Substitution of CFC in foam manufacturing
	1.1	ODS Phase Out	Substitution of HCF-134a for CFC-12 in chiller retrofit