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I. The IDB and the Environment

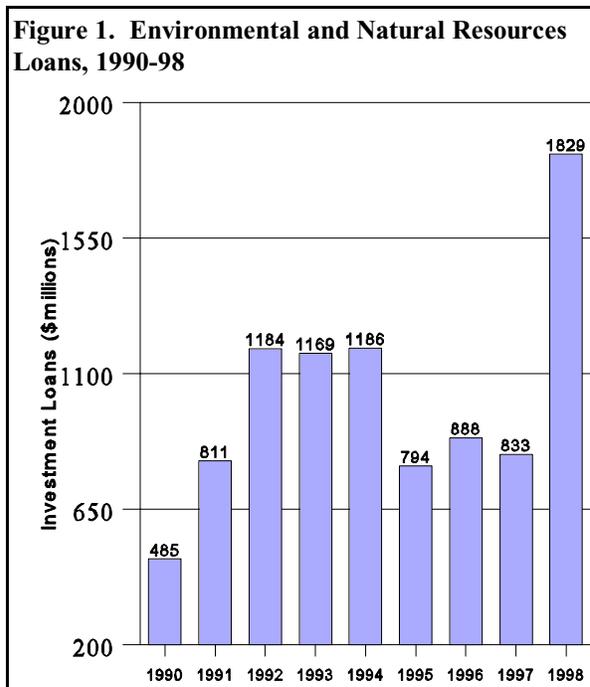
During the past year the Bank has continued to implement the mandates of the Eight Replenishment of 1994 to enhance the environmental quality of Bank operations and support the improvement of environment and natural resources management in the region. The approval of sectoral environment and natural resource strategies, the start of an effort to develop an environmental management strategy for the Bank, continued mainstreaming of environmental concerns in Bank activities, and dissemination of environmental information all contribute to these goals. Lending in environment and natural resources increased significantly in 1998 compared to the previous three years. Furthermore, major efforts were made to help countries recover from the effects of El Niño, whose impacts were felt region-wide, and from the devastation wrought by two hurricanes on the economies of several countries in Central America and the Caribbean.

ENVIRONMENTAL AND NATURAL RESOURCE LENDING

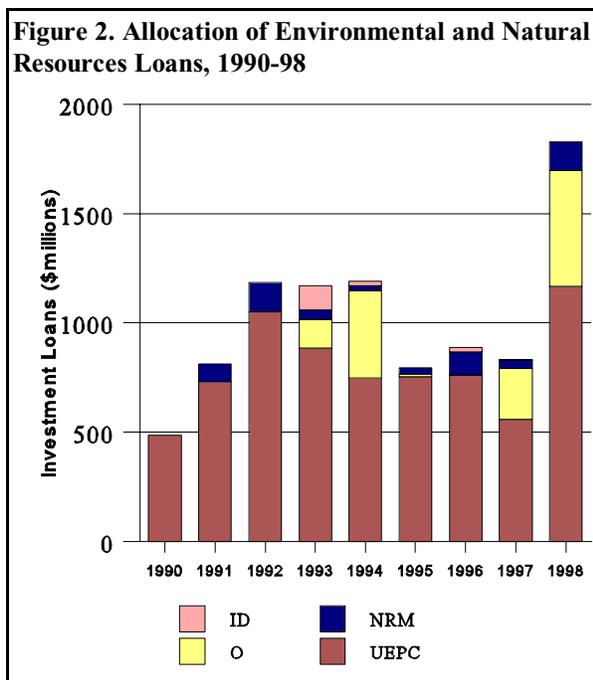
Lending During 1990-98

During the 1990-98 period, investment in environmental and natural resource projects has fluctuated significantly. A steady increase in environmental loans through the 1990-1994 period, which reached a peak of nearly \$1.2 billion, decreased for 1995-97 with the amount of total loan approvals dropping by nearly \$400 million (Figure 1). In 1998, lending more than doubled to slightly more than \$1.8 billion. This is primarily due to a large urban environment and pollution control portfolio and loans aimed at offsetting the effects of natural disasters in the region. The environment and natural resource subsectors of Urban Environment and Pollution Control (UEPC), Natural Resource Management (NRM), Institutional Development (ID) and Other (O)(which includes energy, tourism, resettlement,

and natural disasters) also show differences in loan allocation (Figure 2). Throughout the period, UEPC loans have dominated environmental and natural resource lending, accounting for 80 percent of the total value of loans. Subsector trends show an upsurge in lending for UEPC projects through 1992, followed by a steady decline. In 1998, however, UEPC loans reached US\$1.2 billion, more than twice the amount for 1997. Investment in Natural Resource Management shows regular fluctuations every two or three years with a high of \$132 million in 1992 and a low of \$23 million in 1994. Although loans for Institutional Development and tourism, resettlement, energy and natural disasters increased in 1993 after very little outlay in prior years, by 1995 loans for these subsectors were back or close to zero. Due mainly to natural disaster loans, the loan classification “Other” increased substantially in 1997 and 1998.



Geographically, loans approved during the 1990-1998 period were spread out fairly evenly over the three regions of Bank operations, with 34 in Region 1, 31 in Region 2 and 29 in Region 3. Brazil was awarded the highest number of loans with 16 projects, all except two were in the Urban Environment and Pollution Control subsector. The second largest recipient of loans was Colombia with nine projects. The majority of Colombia's loans were in the UEPC subsector, with one project each in ID, NRM and energy efficiency. Brazil was by far the largest recipient in terms of loan totals with over \$3.3 billion. Mexico and Argentina followed with \$1.5 and \$1.4 billion, respectively.



Lending in 1998

In 1998, the Bank approved 21 environmental and natural resource loans totaling \$1.83 billion, principally for urban water supply, sanitation and pollution control. Major efforts were also made to help countries recover from the region-wide effects of the El Niño and from the devastation wrought by two hurricanes on the economies of several countries in Central America. Technical cooperation support was extended through 95 operations totaling \$29.5 million across a broad spectrum of areas, from

strengthening regulatory frameworks in the water sector to designing action plans for biodiversity and nature conservation. Of the total, \$3 million was accounted for by 21 technical assistance operations related to natural disasters. In addition, new strategies were approved to guide the efforts of the Bank and its member countries to improve natural resources and environmental management in the region. The implementation of these strategies, as well as new strategic initiatives, are discussed in the next section.

Table 1 shows all natural resource and environmental investment loans for 1998. Gauged by the number of approved loans and their amounts, efficient potable water provision and safe solid and liquid waste disposal remain top priorities throughout much of the region. These included a \$250 million loan to Argentina for an innovative program to support reform in the area of potable water and sanitation by promoting investment by commercial banks. The program will set up two trust funds of \$100 million each to encourage supplementary investment by commercial banks in water and sanitation. The Multilateral Investment Fund (MIF) approved a \$700,000 grant to the state of Goiás, Brazil, to help create a new regulatory framework that will attract private investment in the water and sanitation sector, thereby improving service and coverage.

The 1997/98 El Niño event in the tropical Pacific ocean and the 1998 hurricane season caused economic and social distress throughout the Americas. Several governments of the region implemented measures to cope with these and other natural disasters. Several Bank loans were directed towards natural disaster recovery programs. In 1997, the Bank extended loans totaling \$225 million to help Ecuador and Peru recover from El Niño related damage, and an additional \$335 million was approved in August 1998 to help Argentina and Paraguay. A \$300 million loan will support Argentina's efforts to repair and rehabilitate public transportation, housing, and infrastructure in six affected provinces. In Paraguay, a \$35 million loan will help rebuild roads, drainage and flood protection works, repair bridges and public buildings, and outfit

shelters. Both programs have components to help develop better preventive and protective systems. In Central America and the Caribbean, the Bank prepared emergency loans and provided for flexibility in the application of funds from previously approved ones in order to attend to the needs of Honduras, Nicaragua, Guatemala, El Salvador, Haiti, and the Dominican Republic. Through the emergency and the reformulated operations, Bank financing will contribute to infrastructure reconstruction, and social capital revitalization, as well as to the improvement of the capacity of local institutions to prevent and mitigate emergencies and natural hazards. Activities to be executed with the IDB's support include protection and rehabilitation of infrastructure (road networks, potable water, sanitation, energy, irrigation and urban housing), provision of health care and education services, and food supply.

Other major areas of lending are energy and sustainable development. In Costa Rica, for example, a loan for \$49.5 million will finance a 27.5 megawatt geothermal power plant, the first private sector energy project in Costa Rica to be built on the basis of a build-own-transfer contract awarded through competitive bidding. The project is also the first in the country under the terms of a 1995 amendment to the Independent Power Generation Act designed to encourage private investment in the energy sector. Other projects dealing with the implementation of the Sustainable Markets for Sustainable Energy (SMSE) Program were also initiated (see below for further information).

Under the mandate of its Eighth Capital Replenishment, one of the Bank's fundamental objectives is to foster sustainable development in Latin America and the Caribbean by integrating social, economic, and environmental objectives in its operations.¹ One of

¹ Consistent with prior years, Table 1 uses a fairly restrictive concept of what makes a project environmentally and/or natural resource oriented (i.e. has a principal objective of either environmental or natural resource management, natural resource conservation, or environmental quality improvement). A broader view of sustainable development

the most innovative examples of this commitment is the Program for the Sustainable Development of the Darien Province in Panama (PN-0116), an \$88 million operation aimed at promoting social equity, economic growth and environmental protection in a province that has the highest incidence of poverty in the country, diverse indigenous cultures, and a rich and irreplaceable ecosystem represented by the Darien National Park, an area of such valuable biodiversity that UNESCO has declared it both a World Heritage Site and a Man and the Biosphere Reserve.

Based on the encouraging results of the first phase of the Fundo Nacional do Meio Ambiente (NFMA) in Brazil, and the interest of the Brazilian government to continue supporting the Fund, the IDB approved a second phase in 1998 with a \$24 million loan. A variety of projects will be financed through grants for sustainable natural resource management and conservation, environmental education, conservation units, and applied research and technology development in natural resources and environment. The program also includes institutional capacity-building and environmental licensing components.

would embrace projects aimed at improving human capital and reducing poverty, and could even be extended to include most of the projects the IDB finances. For example, the Environment Divisions of the Bank, all work actively in the agriculture sector, which is underrepresented in Table 1. In 1998, the IDB financed several projects in rural areas and the agricultural sector, such as the Program to Support Small-Scale Cotton Producers in Paraguay (\$42 million), an Agriculture and Trade Policy Reform Loan for Suriname (\$30 million), and an Agricultural Services Program for Uruguay (\$32.4 million). The Multilateral Investment Fund also funded five small agribusiness projects totaling \$8.7 million.

Table 1. Environment and Natural Resources Investment Loans Approved in 1998 (US\$ million)

Country	Project	Amount
<i>Natural Resources Conservation and Rural Development</i>		
Brazil	National Environmental Fund, Stage II	24.0
Guatemala	Support for Restructuring of Food and Agriculture Pro-	33.0
Panama	Darien Sustainable Development Program	70.4
Regional	Terra Capital Fund	4.0
<i>Sub Total</i>		<i>131.4</i>
<i>Urban Environment</i>		
Argentina	Program to Support the Water and Sanitation Sector	250.0
Bahamas	Family Islands Potable Water	14.0
Barbados	Solid Waste Management	13.0
Bolivia	Aguas del Illimani	15.0
Brazil	Low-Income Neighborhood Improvement Program <i>Habitar-Brazil</i>	250.0
Brazil	Porto Alegre Municipal Development	76.5
Colombia	Tibitoc Potable Water Treatment	18.0
Colombia	Cartagena Sewerage System	24.3
El Salvador	Water and Sewer Program	43.7
Haiti	Potable Water and Sanitation Sector Reform Program	54.0
Mexico	Rural Water and Sanitation	310.0
Venezuela	Support for Potable Water Decentralization	100.0
<i>Sub Total</i>		<i>1168.5</i>
<i>Energy</i>		
Costa Rica	Miravalles II Geothermal Power Plant	49.5
<i>Sub Total</i>		<i>49.5</i>
<i>Natural Disasters</i>		
Argentina	Flood Emergency Program	300.0
Dominican Republic	Hurricane Georges Emergency Recovery Program	105.0
Guatemala	Natural Disasters Emergency Support Program	40.0
Paraguay	El Niño Emergency Support	35.0
<i>Sub Total</i>		<i>480.0</i>
TOTAL		1829.4
¹ Infrastructure replacement accounts for a majority of the total value of these loans; consequently total lending may be overstated under a narrow definition of environmental and natural resource lending.		

STRATEGY FOR STRENGTHENING PUBLIC AND PRIVATE ENVIRONMENTAL MANAGEMENT IN LAC

Under the Eighth General Increase in the Resources of the IDB (1994), strengthening environmental management was given considerable attention. The Eighth Replenishment report states that: *“Everywhere in the region it will be necessary to overcome present inadequacies in legislation dealing with, and weaknesses in institutions responsible for, natural resources and the environment, if the trend towards environmental degradation is to be reversed..A significant effort must therefore be made to establish efficient institutional mechanisms to address environmental matters...”*

Furthermore, when discussing the environmental assessment process in the case of projects whose effects cannot easily be identified, the report states that the Bank’s *“... attention will be focused on the borrowing country’s institutional capacity to respond to and manage the possible environmental consequences of those operations.”*

To make this mandate operational in light of changing political and economic circumstances, the Bank decided to develop a Strategy on Environmental Management. This strategy work was initiated in 1998 and will build upon various relevant sector strategy papers prepared by during the last few years (such as Coastal Zone Management, Integrated Water Resources Management, Rural Poverty, Energy, and Sustainable Agriculture). The work will consist of two separate but related areas of attention: the first relates to environmental management by public institutions; the second to the role of the private sector in environment and natural resources.

In recent years, much progress has been made in improving environmental management in Latin America and the Caribbean. Most countries have enacted environmental framework laws, established environmental ministries and implemented environmental policy instruments. However, changes in

political and economic policies have a noticeable impact on environmental management, both positive and negative. The central government’s role is being redefined through a series of structural reforms—some with Bank support—such as an increased reliance on markets and the privatization of state run enterprises, aimed at reducing direct government intervention in the economy. The decentralization and liberalization policies have given room to experimentation and testing of new options, leading to many pioneering market-oriented, incentive-based measures.

There is, however, a sense that many of these innovations, both in terms of market based measures or public administration, have focused insufficiently on environmental management. Despite the institutional and legal developments, environmental and natural resources management still needs to be strengthened. Institutional fragility remains a key barrier to successful environmental management in Latin America and the Caribbean. Among the more visible factors are: little awareness of environmental problems and their consequences; overlapping mandates among related sectoral agencies; decentralization of responsibilities to local public institutions that lack the structures and capacities to deal with changing circumstances; inadequate opportunity for public participation in environmental reviews; scarcity of systematic and qualified monitoring; weak or poorly utilized information systems and insufficient planning; and inadequate environmental standards, procedures, and above all, enforcement.

The changing political and economic circumstances of the region call for a new institutional interplay between the public sector, private sector and civil society. Cost-effective policy instruments and regulatory approaches need to recognize the growing strength of civil society and the potential of public-private partnerships for achieving environmental management goals. These changes require designing a critical evaluation of the existing institutional arrangements, assessing possible implications of the new definitions of the changing role of central governments and promoting the decentralization of

management functions. The potential of public-private partnerships for achieving environmental management goals and the design of innovative financing mechanisms must therefore be explored. These partnerships would be combined with effective incentives to influence and shape private sector behavior in ways that can meet environmental, social and business objectives.

Improving environmental management was included as a priority area in the Environmental Action Plan of the Forum of Ministers of Environment of Latin America and the Caribbean, adopted at their meeting in Lima, Peru in March 1998 (see Chapter IV). As a first step towards addressing this priority area and launching its work on the environmental management strategy, the Bank co-sponsored a Ministerial Consultation on Environmental Management with Ministers of Environment of Latin America and the Caribbean (held in Washington, DC, on September 17-18, 1998). This consultation was organized by the Bank, the Pan-American Health Organization (PAHO), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), and the World Bank.

The objective of the consultation was to review the state-of-the-art of environmental management in Latin America and the Caribbean, exchange information on successful experiences, identify the challenges and obstacles, and define lines of action that could be supported by the international agencies. The consultation focused on three critical themes: “institutional challenges,” “environmental policy instruments,” and “financing,” which were organized into three sessions. For each session, two or three countries made brief presentations on their national experiences, followed by a discussion among participants.

In his keynote speech, President Enrique V. Iglesias reflected on the trends and challenges in environmental management. He noted that in order to achieve sustainable development in the new economic and political paradigm, it was important to address the following critical challenges: the competitiveness challenge; the intersectoral challenge; the trade and

environment challenge; the participatory challenge; the decentralization challenge; and the enforcement challenge.

The strategy work will also further analyze what combination of functions and mechanisms are required for achieving effective environmental management. In order to improve the structures, mandates and capacities of environmental institutions, one needs to better understand the relative importance of the various functions and mechanisms of environmental management. In general, the functions are: (i) setting priorities on the basis of an informed analysis and formulating policies; (ii) coordinating and planning; (iii) regulating; (iv) providing incentives to improve environmental performance; and (v) monitoring and enforcing. The mechanisms include: (i) enacting a clear legislative framework; (ii) developing an appropriate administrative structure; (iii) ensuring adequate funding for environmental operations, especially to sustain a core of skilled technical staff, laboratories and monitoring networks; (iv) implementing decentralization and delegation; and (v) encouraging meaningful public participation. The relative importance of the functions and mechanisms and their actual use will depend on the specific circumstances of a given country, such as the existing constitutional provisions, environmental problem areas, private sector participation and public preferences.

Given the public goods character of environmental management, the public sector will continue to have a very important role. At the same time, however, the environmental potential for the private sector, either by itself or in partnership programs with the public sector, is very large, especially as environmental costs and benefits are increasingly being internalized. To further develop this potential role, more strategic support is needed, especially for the small-and medium-sized businesses that often are not familiar enough with environmental liabilities, opportunities and responsibilities. In order to assess how the Bank Group, and in particular the Multilateral Investment Fund, could best provide this strategic support, the Bank contracted consultants that will seek to establish a leadership role for the MIF in promoting environmentally sound private sector investment in

Latin America and the Caribbean through the development of an environmental strategy for the Fund.

IMPLEMENTATION OF APPROVED IDB SECTORAL AND NATURAL RESOURCES MANAGEMENT STRATEGIES

Coastal and Marine Resources Management

Latin America and the Caribbean provided the stage for several important milestones in ocean and coastal policy in 1998. These included the passage of the Galapagos Special Regime Law in Ecuador, the Belize Coastal Zone Management Act, and the Barbados Coastal Zone Management Act. The Bank is cooperating with all three programs. In the case of Barbados, Bank financing directly contributed to the legal and institutional reforms which have resulted in the eastern Caribbean's first permanent coastal zone management program. It is in this context of rapidly evolving policy that the Bank's own strategy for coastal and marine resources management was approved by the Board of Directors on June 17, 1998.

The strategy and accompanying background paper were featured at several regional meetings during the course of the year including workshops organized by CARICOM in Trinidad and Tobago on the Caribbean Sea and the Inter-Governmental Oceanographic Commission (IOC) of UNESCO on capacity building for marine sciences in Cartagena, Colombia. To further awareness and discussion of the strategy, the Environment Division hosted a seminar for U.S.-based environmental NGOs and academic institutions actively involved in the region. Another seminar was held to introduce the strategy's new orientation towards fisheries management and conservation.

Implementation of the approved strategy moved along several fronts including, the development of new alliances for ocean policy, application for loans, technical cooperations in execution and under preparation, and a few selected studies. Coordination of efforts and priorities were the focus of discussions with the IOC, the Global Environmental Facility, the U.S. National Oceanographic and Atmospheric

Administration, the U.S. Coast Guard, the Marine Policy Institute of the University of Delaware and several other European and U.S.-based marine research institutes and NGOs. These strategic alliances should enable the Bank to use its limited grant funds to help leverage innovation in marine resources management the region.

Projects in execution and preparation continued to offer the ideal laboratories for applying the principles of the strategy and learning how to best tailor innovative approaches to specific conditions in the region. Several new operations in coastal management were approved in 1998 (see Chapter 3), including a local coastal management initiative in the Northeast of Brazil where a new decentralized model to coastal management is being developed with the active participation of rural coastal towns. An operation aimed at building coastal management capacity in Haiti was also approved. A community-based coastal monitoring program for the Toledo District in Southern Belize was approved to complement environmental monitoring activities being undertaken for the Belize Southern Highway Program.

In order to look ahead at the major trends affecting coastal development in the region, a few policy-related studies were initiated in 1998 linked to the basic tenets of the coastal and marine resources management strategy. A review of conflict management approaches and their application to coastal management was completed with final results expected in early 1999. The Bank supported a two-week regional training workshop on the applications of remote sensing and digital photography for coastal management in Uruguay, which was attended by practitioners from Brazil, Uruguay and Argentina. Two new studies were launched – one on approaches to the analysis of public sector investments in tourism within the coastal zone and another on sub-regional mechanisms for the multi-national management of coastal and marine areas.

The IDB and Global Climate Change: Challenges and Opportunities

The Kyoto Protocol, adopted in December 1997, represents a historic landmark in the global climate change negotiations. It not only establishes binding emission reductions for developed countries, but also creates mechanisms that should enable developed countries to achieve their reductions in a cost-effective manner while supporting sustainable development.

The Clean Development Mechanism (CDM), one of the three cooperation mechanisms provided under the Kyoto Protocol for reduction of greenhouse gases, is the only one in which developing nations can participate. Unlike the other two (emission trading and Joint Implementation), the CDM is not just an emission reduction instrument, but is also established to assist developing countries achieve sustainable development.

It is expected that full implementation of the CDM may take several more years. The role that international financial institutions and United Nations agencies can play in establishing and implementing the CDM could be potentially significant. To analyze the options available to the Bank to participate in establishing and implementing the CDM in support of its borrowing member countries, the Bank held the forum “A Regional Approach to the Kyoto Challenge: The Role of the IDB” on September 29 and 30, 1998.

The forum presented background information on several aspects related to the CDM as well as the activities of other multilateral organizations on climate change and their role regarding the CDM. Also discussed were different views on private sector opportunities for investing in Latin America through the CDM and proposals for possible Bank activities. The Forum recommended that the Bank take action in the following areas: (i) capacity building and technical support, (ii) information networks, and (iii) risk reduction for private sector investment. Selected areas of work include the following:

Concentrate on providing support for its borrowing member countries in preparing their own national positions, and if possible, facilitate regional consensus building. The Bank could play the role of facilitator in a dialogue with its borrowing member countries.

Consider preparation of a broader Bank Strategy on Climate Change. Such a strategy could address the main action areas proposed by the participants at the Forum. The strategy could also encourage and emphasize the use of market mechanisms by all countries as a preferred option when dealing with climate change issues.

Include climate change issues in the programming dialogues between the Bank and its borrowing member countries.

Act as a catalyst for private sector transactions by for instance, providing guarantees on compliance to reduce risks. It was also suggested that the Bank should not only have the expertise but also the mechanisms to facilitate certified emission reduction transactions between the private sector and host countries. The Bank could also serve as a matchmaker between investors and host countries and as a clearinghouse for CDM projects, thereby facilitating an equitable regional distribution of projects.

Sustainable Energy Markets (SMSE)

Developing markets for sustainable energy is the latest and most innovative IDB approach to the creation of a market environment in Latin America and the Caribbean. It is expected that this will result in large numbers of projects involving energy efficiency, renewable energy sources and clean, effective urban transport to benefit countries, consumers, companies, and donors. Established in 1996, the central objective of the Sustainable Markets for Sustainable Energy (SMSE) Program is to act as a catalyst for establishing these markets in a context of economic and sectoral reform, restructuring, and decentralization. Three initial areas of focus were chosen: (i) energy efficiency, primarily in industrial sector applications; (ii) the use of renewables in

rural, offgrid applications; and (iii) more efficient energy use in urban transportation. To date, six projects covering these areas have been developed in five countries—Argentina, Brazil, Ecuador, El Salvador, and Peru—and the program has mobilized nearly \$5 million in external donor funding to prepare them for implementation. The SMSE Program has pioneered an important new approach to addressing the challenge of introducing energy efficiency and renewable energy into markets in these countries. It is expected that these activities will become an integral part of the Bank’s operations as additional countries enter the program.

Through these projects, borrowing countries have incorporated energy efficiency either as part of larger multipurpose loans to government-owned electric utilities or, more recently, as separate loans for broad-ranging, government-sponsored energy efficiency programs. Nonconventional renewable energy projects have included small-scale hydroelectric and geothermal projects through the Inter-American Investment Corporation (IIC) and the IDB Private Sector Facility, respectively. Similarly, the IDB’s Multilateral Investment Fund helped to establish E&Co-LAC, a subsidiary of E&Co Corporation, which has been demonstrating the technical viability and economic feasibility of smaller scale, decentralized energy projects in Latin America and the Caribbean.

Integrated Water Resources Management

The Bank Strategy for Integrated Water Resources Management (IWRM) was approved by the Board on May 27, 1998. This included a Strategy Background Paper and an Action Plan for implementation of the strategy. Although some of its principles were initially brought into practice in actual projects and activities during 1997 and the first quarter of 1998, following the approval of the IWRM strategy, priority activities have focused on internal Bank dissemination and support for initial Bank-wide implementation or “mainstreaming” in accordance with the Action Plan.

The Environment Division completed several good practice papers and disseminated the information through internal seminars, followed by cooperation and collaboration with Project Teams. The three good practice papers prepared discussed legal and regulatory frameworks, the application of an IWRM analytical framework, and the consideration of freshwater ecosystems in water resources projects. With the cooperation of the UN Economic Commission for LAC and International Institute for Infrastructure, Hydraulic and Environmental Engineering (Deft, The Netherlands), the Bank organized a seminar at headquarters to present two papers to the staff of central departments and operational regions.

SDS/ENV cooperated in project development through continued staff participation in Project Teams and the preparation of Technical Cooperation Profiles. This was done in selected programs where the inclusion of important IWRM principles were considered advantageous because of the nature of the project and the type of stakeholders involved. Support for IWRM activities for Bank projects in Costa Rica, El Salvador, Haiti and Paraguay started in 1997 and continued with projects in Brazil, Dominican Republic, Honduras, Guatemala and Jamaica. The countries of Central America also received assistance for the development of IWRM policy through a regional technical cooperation.

Further efforts to disseminate widely the IWRM strategy and activities included presentations at events in Argentina, Brazil, Costa Rica and France. Technical cooperations in support of capacity building for weather and climate predictions and hydrometeorological natural disaster preparedness were continued throughout the region by means of two feasibility studies: one on Ibero-American Climate and the other on Socio-economic Impact of El Niño. The first is under execution and the second is under preparation. A study of early warning systems for El Niño events was also under-taken at two demonstration sites in Peru.

Approval of the strategy resulted in renewed attention to the institutional aspects of IWRM and watershed management, especially in transboundary

cases. The issue of water quality and water pollution management in a watershed context are discussed in a good practice paper that is currently under preparation. Initial contacts were made for the preparation of technical cooperations regarding on dams and the environment, the legal aspects of transboundary basins, and the assessments of the status and compilation of good practices for IWRM and watershed management institutions and river basin organizations.

Rural Poverty Reduction

The Bank Strategy for Rural Poverty Reduction was approved by the Board of Directors on April 1998 (published in July 1998 as *Rural Poverty Reduction*. Bank Strategy Paper ENV#122). The strategy included a plan of action and a background paper (published in July 1998 as *Strategic Elements for the Reduction of Rural Poverty in Latin America and the Caribbean* ENV#112).

The strategy focuses on several options and instruments to reduce rural poverty in the region, that take into account the heterogeneity of the rural poor. According to the document, key requirements to reduce poverty are the development of favorable macroeconomic and sectoral policies, investment in infrastructure, education, health and social services, and emphasizing the restoration and management of natural resources.

About half of the rural poor in Latin America and the Caribbean have very limited access to productive resources with which to generate sufficient earnings from agricultural production. Recognizing this fact, the strategy makes the distinction between specific programs to reduce poverty for small farmers with agricultural potential and programs to create employment and increase earnings of other rural inhabitants, including small farmers with less agricultural potential.

Several instruments (such as land titling, investment in micro-irrigation and water markets, research, technology transfer and technical assistance, the development of rural financial markets and the

promotion of new market opportunities) were highlighted as key elements to assist small farmers with agricultural potential. On the other hand, the development of land markets; investments in extension services and informal education; the promotion of microenterprises, small businesses and financial markets; and vocational training for better job opportunities in rural areas, towns and cities were included in the strategy as potential instruments to reduce poverty for those rural inhabitants with limited agricultural potential.

The plan of action calls for the development of strategies at the national level, the conceptualization of medium-term programs to reduce rural poverty (which could be implemented in stages), and more emphasis on the execution of such programs based on an analysis of the experience of past programs.

Two major activities were carried out during 1998 to follow up on the action plan. The first one was the final preparation and publication of a technical document on perspectives to improve rural land markets in Latin America (published in November 1998 as *Perspectivas sobre mercados de tierras rurales en America Latina*. ENV#124). The document includes the work of several authors and highlights the role of the state as well as the importance of establishing property rights in rural land markets, the need for reforms to increase access to land in Central America, the experiences with several rural land policies in Brazil, and the need to develop new policies and instruments to increase the effectiveness of rural land markets in the region. It is expected that, in the near future, demand for IDB financing of rural land projects will increase as a result of the guidelines presented in the document.

The second follow-up activity of the rural poverty reduction strategy was the development of a preliminary proposal (*Enhancing the Inclusion of the Rural Poor in Latin America's Rural Development*, prepared by Cecilia Lopez Montaña and Maximiliano Cox) to define practices, approaches and options for rural development in the region. A consultation was organized in November 1998 with the participation of experts from universities, foundations and several

technical and multilateral agencies (the International Fund for Agricultural Development; the UN Economic Commission for Latin America and the Caribbean; the Interamerican Institute for Cooperation in Agriculture; the UN Food and Agriculture Organization; and the World Bank) to discuss the hypothesis and case studies proposed in the document. As a result of the consultation a proposal has been developed to analyze recent experiences in rural development in three countries of the region. The first phase of the project will start in 1999 with financing from an IDB Regional Technical Cooperation.

CESI REVIEWS IN 1998

The Committee on Environment and Social Impact (CESI) reviews most Bank operations twice during the project cycle. First during the Profile 2 stage to determine the type of analysis and procedures required to identify the impacts the operation might produce, and once again, when the project's environmental and social analysis has been completed and summarized in the Environmental and Social Impact Report (ESIR) to determine that the operation incorporates the measures required to address and mitigate those impacts. The CESI reviews Technical Cooperations (TCs), Small Projects (SP), and MIF projects, as well as loan operations. Although operations under \$3,000,000 generally are reviewed under expedited, short procedure, all operations are subject to the committee's approval.

During the first stage of review, the CESI examines the Profile 2 (or Plan of Operations) for the project and its associated Environmental and Social Impact Brief (ESIB), and defines the scope of the impact analyses that should be carried out during project preparation. It is at this point that the committee specifies whether a full Environmental Impact Assessment (EIA) should be prepared, or whether other specific technical studies or measures will be required instead of a full EIA. Such technical studies might include a limited analysis of local regulatory

requirements or an assessment and plan for the resettlement of affected populations. Actions that might fall within the category of "other measures" might include more limited stipulations subjecting the project to existing regulatory requirements or standards. A number of projects require no environmental or social assessment or review.

As illustrated in Table 2 in 1998 the CESI reviewed a total of 254 operations in the initial stages of project preparation (Profile 2, ESIB, Plans of Operation and Terms of Reference), and 143 in the later stages prior to loan approval (ESIR and Projects Documents). The CESI stipulated that EIAs were to be prepared for 31 (32%) of the 97 loan operations examined in the Profile 2 stage, while requesting other studies in 47 (48%) of the loans. Nineteen loans (20%) carried no environmental or social impact requirements. As most Technical Cooperations involve studies or workshops with little direct environmental or social impacts, the requirements set forth for these tended to cover issues or subjects that needed to be included within the scope of the project. An analysis of Table 3, shows an increase in EIA requirement for loan operations nearing approval: EIAs had been prepared for 37 (52%) of the loans reviewed by the CESI. However, none of the Technical Cooperations or Small Projects involved such analyses. Overall, the CESI considered a total of 397 routine operational documents during 1998. Some of these (approximately 30) referred to the same operation at different stages. The CESI also considered 30 special documents, 23 of which were revised briefs and reports. The remainder dealt with procedures, training programs or special consultations.

Table 2. ESIB or Profile Phase						
	Loans	%	TCs	%	SPs	%
EIAs	31	32%	0	-	0	-
Other Studies	47	48%	48	34%	9	64%
No Requirements	19	20%	95	66%	5	36%
Subtotals	97		143		14	
GRAND TOTAL	254					

Table 3. ESIR or Approval Phase						
	Loans	%	TCs	%	SPs	%
EIAs	37	52%	0	-	0	-
Other Studies	31	44%	22	33%	6	100%
No Requirements	3	4%	44	67%	0	-
Subtotals	71		66		6	
GRAND TOTAL	143					

ENVIRONMENTAL INFORMATION SERVICES

The Environment Division plays an important role as a source of innovation and a clearinghouse for environmental information. Two efforts to streamline the provision of information services on sustainable development to other departments in the Bank and to the general public are noteworthy.

Mapping and spatial data services and demonstrations on their applicability were provided to many project preparation teams. Among the latter, satellite imagery and GIS methods were used to demonstrate the exact extent of El Niño's effects along Peru's northern coast. This information can be used by disaster management officials to identify what areas and types of infrastructure will be at risk in the future. GIS methods and satellite imagery were also

used to help in the implementation of a Bank financed program to provide low-cost housing loans to families in Guatemala City. A map was developed which showed areas at risk from landslides. This information was used to determine which areas would be excluded from future development and those where retaining walls and other safeguards would be required.

The second effort involves the improvement and continual updating of the Environment Division's web page (<http://www.iadb.org/sds/enve.cfm>). Under its current structure, the main page contains the Division's mission statement; guidelines and environmental assessments prepared by the Bank; a list of publications prepared by the Division; upcoming events; areas of special interest, including the Committee on Environment and Social Impact, the Sustainable Markets for Sustainable Energy, a link

to the Regional Fund for Agriculture Technology; and an area with related links. The web page is divided into sections with information on: Integrated Water Resources Management, Urban Environment and Pollution Control, Forestry and Biodiversity Conservation and Management, Coastal and Marine Resources Management, Sustainable Agriculture and Rural Development, Energy Conservation and Alternative Sources of Energy, and Environmental Management, Law and Economics. In addition to mission statements, each section has News, Upcoming Events, Publications, and Related Links. The information is sector-specific. This recently devel-

oped structure allows the Division to maintain an up-to-date Web page with all of its products available in Hyper-Text Markup Language (HTML), Rich Text Format (RTF), and Portable Document Format (PDF).

In addition, the Bank's main web page (<http://www.iadb.org>) contains abstracts of strategy and policy work done in environment and natural resources. Summaries of the Coastal and Marine Resources Strategy and the Integrated Water Resources Management Strategy were posted recently.

II. An Energy Sector Strategy

Since the 1960s, increasing local demand for energy has been met by substantially expanding electricity coverage while at the same time consolidating the region's position as a net exporter of oil. However, that development was not based on an economically, financially, and environmentally sustainable model. The crisis in the 1980s demonstrated that the traditional model based on state monopolies and indiscriminate consumer subsidies had run its course. Declining electricity rates and energy prices, the dearth of incentives for efficiency, and the exhaustion of traditional sources of finance led to region-wide financial crisis in the electricity sector. Energy price distortions and the tendency to seek self-sufficiency (which restricted intraregional trade) were among the factors that exacerbated the crisis by limiting options and encouraging waste. Moreover, rapid urbanization over recent decades has led to an enormous increase in demand for transportation. Heavily subsidized fuel and the lack of mass transit systems encouraged the use of automobiles, leading not only to congestion but also to a deterioration in the quality of the environment.

Sectoral reforms undertaken by countries to overcome the energy crisis were part of the overall macroeconomic adjustments that pursued price stabilization through fiscal equilibrium. These reforms were nourished by an almost universal acceptance of the new role of the State in the economy; by the possibility of raising government revenue by selling off assets; by rapid technical progress in the production, transmission, measurement, and use of energy; and by a new approach which made it possible to view these products as a commodity, rather than a strategic asset. The outcome was a set of far-reaching changes in the institutional, organizational and regulatory framework of the energy sector in the region which took place during the past 10 years. These changes initiated the transition to a more competitive sector, with considerable private

sector participation, albeit with marked differences in the pace of reform and with major problems still to be resolved (such as the social and environmental feasibility of the reforms).

These changes have affected the Bank in various ways. On the one hand, the volume of loans to the energy sector decreased substantially beginning in the mid-1980s as a result, first, of the debt crisis, and then of the increased availability of new sources of financing. On the other hand, during that same period, the Bank began revamping its own management structure and instruments in order to adjust to the region's new circumstances. Given the nature of the newly emerging energy markets and the challenge of achieving sustainable environmental development, the Bank can be expected to increase both its lending and its use of nonlending products during the transition to a market economy in the energy sector. However, its activities will have to introduce new instruments and reach wider market segments than in the past.

The energy strategy² is part of a new set of strategies and policies formulated under the mandate of the Eighth Replenishment. It should be interpreted in the context of those guidelines, especially the ones referring to the new public utilities policy, but also the strategies on infrastructure financing, the private sector, financial markets, poverty reduction, rural development, urban development, sustainable agriculture, and forestry. The energy strategy complements and is complemented by other strategies. Together they orchestrate a set of activities designed to take advantage of the Bank's experience and installed capacity in different sectors. In this way

² The strategy was submitted for consideration by the Bank's Board of Executive Directors in 1998. A draft version is available via the Internet at: <http://www.iadb.org/sds/content.cfm?parent=60&id=141>.

they optimize the use of the Bank's limited resources to assist countries in the consolidation of energy sector reforms and the sustainable development of energy markets. It is expected that the document will give the Management of the Bank the tools it needs to examine the administrative changes required for treatment of the new activities emerging as a result of the strategy.³

OBJECTIVES OF THE STRATEGY

The chief objective of the strategy is to guide the Bank in its efforts to support countries engaged in restructuring and reforming their energy sectors in order to promote a pattern of development that is *economically, financially, environmentally, socially, and politically sustainable*. In attempting to achieve this goal countries face five challenges: (i) the consolidation of structural and economic reforms undertaken in the first half of this decade (economic, financial, environmental, social, and political sustainability); (ii) extension of modern energy options to all citizens on affordable terms (social sustainability); (iii) development of efficient and, at the same time, environmentally friendly patterns of energy production and consumption (environmental sustainability); (iv) mobilization of the foreign and local capital needed to finance the sector (financial sustainability); and (v) integration of regional energy markets following economic integration (economic and financial sustainability).

The Consolidation of Sector Reform

Progress in energy sector reform in the region varies considerably and a major ongoing effort is needed to consolidate the progress achieved so far. Even

³ Implementation of the strategy is a dynamic process enriched by experience and lessons learned. The document itself is static; it necessarily reflects the circumstances and outlook of the time when it was written. To make the strategy document easier to understand and to update, a separate paper – *Strategic Elements for the Energy Sector in Latin America and the Caribbean* – is also available. It will be supplemented over time by documents on best practices and specific guidelines, as well as by periodic evaluations of results.

pioneering nations such as Chile and Argentina have decided to review their energy systems and broaden competition by allowing small- and medium-sized consumers to choose their energy suppliers. Several of the largest countries in the region (Brazil, Mexico, and Venezuela) have barely begun to reform, while other countries that had moved ahead are having problems implementing the new approach. How lasting the reform proves to be in each country depends on progress in three key areas: the transition from an entrepreneurial State to a regulatory State; the search for efficiency through competition; and private sector participation in business operations.

In early 1998, only five countries had a regulatory authority that had been functioning for more than a year, and only three electric power exchanges were reasonably competitive. However, private sector participation had made considerable strides in some eight countries. Most of the countries in the region lack or are only just beginning to establish the institutions required to supervise competition in a market economy.

The slow pace of progress reflects the difficulties this encountered. Reassigning business functions to the private sector is not just a matter of transferring ownership of existing utilities. It also involves restructuring functions, many of which can be performed by agents that normally distribute other consumer goods and services. It also means that the State has to be strengthened in those roles which it should play. The restructuring differs for each segment in the energy sector, depending on the particular features of each specific type of company, and the level of competition and regulation, and/or credit needs. The nature, pattern, and pace of change is also influenced by the urgency of extending services to the entire population, integrating regional markets, and achieving an environmentally sustainable outcome. The task of restructuring the energy sector and simultaneously creating new regulatory bodies is especially burdensome for small countries. Finally, political pressure and the economic and social downturn mean that any delays in passing on the benefits of the reform to users cast doubts on its

very feasibility by creating confusion about the true causes of the problems and by strengthening anti reform movements.

Extension of Modern Energy Options to All on Affordable Terms

The impressive figures for electricity coverage in Latin America and the Caribbean (84 percent) disguise the fact that 60 percent of the rural population, or approximately 75 million people, lacked electricity in 1997. Much of the energy consumed in the countryside is still “traditional” (mainly burning of biomass materials for cooking) and the shift to modern forms of energy is not occurring as rapidly as it should, despite the fact that the rural population without access to electricity has been dropping in absolute terms over the past 20 years. The countries in the region with the lowest levels of access to electricity are the least developed ones: Nicaragua, Guatemala, Honduras, Haiti, Bolivia, El Salvador, and Peru, where less than 20 percent of rural households have electricity.

In the past, rural electrification programs were centrally planned and had limited objectives. They were heavily subsidized and lacked sufficient community support and participation. Simultaneously, state monopolies in the distribution of electricity led most countries in the region, often pursuing goals unrelated to the sector, to carry out an inefficient and costly expansion of the network, while restricting access by other agents and technologies that might be in a position to offer the same services at lower cost. This “hidden competition” implicit in the possible expansion of a heavily subsidized network constitutes a powerful barrier against the entry of other alternatives. If distribution is privatized, private entrepreneurs will lack incentives to expand the network unless huge subsidies are granted, therefore the expansion of the service in rural areas would be negligible if new mechanisms to provide such services are not promoted. One of the goals of the program is to test other private sector mechanisms that would be more effective than large private utilities at reaching rural households that lack electricity.

Developing Efficient and Environmentally Friendly Patterns of Energy Production and Consumption

Both the local and the global environmental impact of energy production and consumption in the region are dominated by transportation, and by urban transportation in particular. Air pollution problems in general are undoubtedly growing rapidly in Latin American and Caribbean cities, at a considerable economic cost. Accordingly, any policy for addressing urban pollution and climate change in the region must focus on this key sector. In rural areas, environmental problems stem from the production and transportation of modern forms of energy (for urban use) and the use of traditional forms of energy based on the use of biomass for cooking. Paradoxically, hydropower is sufficiently abundant in the region to provide the best option for minimizing emissions, yet faces restrictions because of its local environmental impact.

The Intergovernmental Panel on Climate Change estimated that in 1990 emissions from Latin America and the Caribbean accounted for 4.8 percent of global greenhouse gas emissions. This is significantly less than in developed countries or transition economies and even many other parts of the developing world, mainly because of the high hydropower component and very low level of coal in the region’s energy basket for electricity generation. Transportation (35 percent) and manufacturing (22 percent) are the main sources of CO₂.

The impact of the reforms in the electricity and gas sectors on the environment have generally been positive, reflecting greater efficiency in the production, transmission and distribution of electricity, and the use of natural gas instead of oil derivatives or coal. Nevertheless, countries in the region have to ensure that the reforms do not pose a threat to the environment, but instead become an opportunity to achieve environmentally sustainable development. Although protection of the environment is mentioned in the legislation of most countries as an objective for the sector, generally speaking the implementation of regulations to achieve that goal warrants improve-

ment. This situation has implications for several players in the sector. Regulatory authorities and civil society will be responsible for enforcing environmental standards and policies. Governmental bodies introducing market mechanisms will need to design appropriate incentives to encourage energy producers and consumers to promote environmentally friendly activities. National and municipal governments faced with the ongoing deterioration of urban air quality caused by vehicle emissions, must confront both the local and global implications and reconcile complex jurisdictional issues arising out of its cross-sector nature. Finally, the role of energy consumption in the climate change problem places energy sector authorities at the center of attempts to implement the agreements reached under the Kyoto Protocol.

Attempts to make energy consumption more efficient have not had much success in the region for various reasons; only Mexico and Brazil have achieved results. Renewable small-scale sources of energy are only competitive in certain niches (such as rural areas unconnected to the network), and as support for very long distribution feeders (what is known as distributed energy). These sources of energy could have a broader market share were it not for rules of the game that are slanted toward conventional supply investments, not to mention other barriers and flaws in the market. In an attempt to overcome such barriers, over the past two decades, regulatory agencies in the United States and other developed countries have promoted instruments such as Demand Side Management (DSM) and Integrated Resource Planning (IRP) in the vertically integrated electricity monopolies in their countries. Based on that experience, NGOs and some governments have lobbied over the past 10 years for multilateral organizations to promote the adoption of these measures in developing countries as well. However, with the liberalization of markets, both DSM and IRP have lost ground and other ways have to be found to foster the use of renewable sources and end-use efficiency.

Mobilizing Resources for the Sector

The difficulties encountered in the 1980s in attracting the funds needed for expansion of the energy sector do not automatically disappear when a new paradigm for the sector is adopted. Many countries that aggressively implemented sector reforms by seeking out private investors and introducing competition, had difficulty mobilizing the resources they needed on appropriate terms. The availability of financial resources also depends on other conditions which frequently require additional reforms in other sectors. Furthermore, the energy sector is far from homogeneous. Total investment needs and the type and volume of financing vary depending on the market segment, its vitality, and the specific nature of the investment. Difficulties in mobilizing resources can thus be classified according to whether they are a result of the perception of risk on the part of investors, the special nature of a given segment of the market, or weaknesses in local financial and capital markets.

Attractive investments in products that can be sold on world markets, such as oil and petroleum by-products, are generally made by multinationals and have little trouble mobilizing financing. Non-tradeable products, such as electricity and, in many cases, natural gas, find it more difficult to do so. At the same time, investments and services seeking to make more efficient use of energy and/or small-scale renewable sources are considered exotic products that are difficult to finance. Expansion of natural monopolies like electricity and gas networks usually do not require large-scale investment and can be financed by corporate loans. Independent electricity producers require project financing, whereas some investments in energy efficiency and decentralized generation require consumer or microenterprise credit. A key feature of investments in hydroelectric power generation projects (which are capital-intensive, have a long construction phase, and have a long useful life) is that they require very long-term loans with extensive grace periods, whereas investments in efficient energy use can generally be paid back with the savings generated in a relatively short period. In some cases, such as activities that are considered a

natural monopoly, there are only one or a few big borrowers. In others, such as the efficient household use of electricity, the market consists of the entire population. There are also countries and subsectors in which, for various reasons, much of the investment will have to be made by the State, at least for the time being.

The fact that energy markets and the return on projects are dependent on government actions is reflected in the degree of political and regulatory risk. These risk levels⁴ are in turn reflected in a reluctance to invest or in a demand for high returns to offset them. Traditional political risk⁵ can be covered by State insurance agencies in many countries and through instruments provided by multilateral organizations, such as Multilateral Investment Guarantee Agency (MIGA). However, nontraditional political risk, or the regulatory risk resulting from a change in economic or sector regulations or from erroneous interpretation of a contract, cannot be adequately covered by insurance due to difficulties in their standardization. Regulatory risk can take on different forms in each market segment. Thus, the new competitive environment in the electricity sector introduces new risks that are not easily understood by financial institutions and are sometimes mutually reinforcing. Consequently, proper management and distribution of all these risks becomes the key to attracting capital from either the public or the private sector.

Because of the shortcomings of financial markets in many countries, often the constraint is not availability of funds but rather the lack of appropriate intermediation to serve the needs of energy consumers or investors. This problem is particularly acute in the case of consumer credit and credit for small farmers.

⁴ Risks are greater for products that are not tradeable on international markets, such as electricity, and for countries with a poor track record in international financial markets, or with incipient regulatory institutions.

⁵ These include: the risk that a government authority may decide to expropriate or confiscate the property of an enterprise or declare the country's currency nonconvertible, or risks associated with armed conflict.

There is no credit culture or tradition of funding small-scale energy projects in the region. Financial analysts are not accustomed to evaluating such projects: they are not used to measuring the risk of changes in absolute and relative prices for different forms of energy, nor to measuring demand in competitive environments. As a result, financial institutions are reluctant to finance this type of project.

Incipient Development of Local Capitals Markets

Energy projects have a very long useful life, over 20 years in most cases, and the income they generate is usually in local currency. They therefore require long-term local currency funding, which is not always available. Often the only financing available is short-term and in foreign exchange, which subjects an enterprise that accepts it to considerable liquidity pressure and exchange rate risk. Moreover, since in most of the countries of the region there are practically no instruments to mitigate such risks and the possibilities of refinancing a short-term loan are uncertain, the supply of private financing is limited and the interest rates charged are extremely high. Foreign pension funds offering long-term resources are reluctant to lend to a business with high political risk, while national pension funds are, with the exception of Chile's, still incipient. Thus, the sheer size of investments in the energy sector in the region make it impossible to depend (over the long term) on capital and financing from abroad.

Integration of Regional Energy Markets

The countries of Latin America and the Caribbean possess abundant and varied energy resources, including oil, natural gas, coal, biomass and other renewable sources, as well as great hydropower potential, even though these resources are not always evenly distributed. However, it is precisely that uneven distribution that underscores the tremendous potential for large-scale trading in energy in the region. Currently, intraregional trade is dominated by exports of crude oil and oil byproducts, but there are very promising prospects of integrating energy markets through natural gas and electricity grids,

which have only recently begun to take off. The integration of gas and electricity markets is taking place mainly in South America, where major international gas pipelines and electricity grids exist or are currently being built. The marketing of natural gas and electricity at the sub-regional and regional levels does not only lead to more efficient use of resources; it also helps to consolidate reform in this sector in small countries.

ENERGY MARKETS AT THE DAWN OF A NEW CENTURY

Driven by economic development and population growth, the demand for energy in the region will continue to increase over the next decade. The demand for oil, which grew at an average annual rate of 3.5 percent over the past decade as a result of automobile use, will increase at an even faster pace due to urbanization and improved living standards. Demand for electricity is also growing (at an average annual rate of around 6 percent), although the pace of growth is beginning to slow as the result of possible market saturation and greater efficiency in end-usage (it is estimated that 80 to 85 GW of new installed capacity will be needed by the year 2006). However, the relative share of primary energy sources in meeting this demand may change considerably, owing to the abundance of natural gas and the marked decline in costs following the introduction of new combined cycle gas turbines (CCGT) and environmental and other considerations. Natural gas will become the bridge fuel toward the energies of the future, and it will call for major investments (especially in gas pipelines). International trade will grow substantially to meet demand and, for the first time, drillings will be carried out primarily for natural gas. Investment needs in the region will continue to be dominated by drilling and production of oil and gas and by electricity generation.

Energy demand is ultimately derived from the demands of final consumers for heat, cooling, light, and power services, so the solutions to many problems have to be found outside of the bounds of the energy sector itself and are not feasible without a comprehensive approach focusing on consumer activities.

Consequently, the strategy must cover all the links in the chain of production, transportation, marketing, and consumption of energy, albeit with different degrees of emphasis both in intensity and in spheres of activity.

A Multiplicity of Markets

Developments in the last five years of the twentieth century point to a clear fragmentation of the energy market into several segments with differing participants, features, risks, and credit needs. A segment is classified mainly according to its degree of exposure to competition (depending on whether it operates in the competitive market or in the regulated grid market), and the type of product offered (be it a commodity or a service), although not necessarily on the type of fuel. Thus, if present trends continue, different types of markets can be expected to gradually develop or become consolidated.

Commodity markets will be highly competitive wholesale markets with narrow margins for crude oil and oil by-products, electricity, and natural gas. The latter two will be helped by instruments such as energy exchanges that facilitate trade. In this system the old independent power producers (IPP), based on long-term projects guaranteed by governments, would be gradually replaced by so-called merchant plants. A merchant plant sells its energy on the spot market and/or negotiates contracts with individual clients, but does not have a captive market. Partly in order to spread risks more evenly, there is likely to be a convergence between the markets for electricity and fuels, especially natural gas.

A *competitive market in differentiated energy services* will include retail marketing of electricity and/or natural gas, but may also include efficient energy use services. Participants in this market include:

- traders and brokers in the wholesale and retail electricity and/or natural gas markets;
- energy service companies (ESCO) that engage in various energy saving and/or cogeneration activities for industrial and/or commercial clients;

- total energy service companies (TESCO), which also provide efficiency services and offer clients a package covering all their energy needs for a lump sum; and
- service companies that may include telephone, water, and other services, as well as energy, or companies specializing in meter reading and billing.

A *competitive market for goods and services in decentralized systems* would comprise numerous companies competing to serve the widely-dispersed rural market with individual systems fueled by renewable sources of energy or fossil fuels.

A *network services market* generally consists of regulated monopolies obliged to provide free access to the network, served by transmission companies (or transportation companies in the case of natural gas) and associated services, distribution companies at the end-user level, and small-scale networks in isolated systems based on thermal, renewable, or mixed energy systems.

Multiplicity of Stakeholders

Supporting the development of these markets implies working with a variety of government institutions at the national, regional, and municipal levels, with local and foreign private entrepreneurs, multinationals and microentrepreneurs, cooperatives, community organizations, and NGOs, as the case may be. Electricity generating markets will be dominated by a relatively small group of multinationals, in many cases associated with production of a single fuel and a diversified portfolio. Likewise, the network markets will largely be served by multinationals, while the marketing and energy service markets will permit a larger number of participants with lower capital requirements in an environment in which small-and medium-sized enterprises may flourish. Rural energy services may be dominated by large multinational firms as far as the supply of equipment is concerned, but their distribution, sales, and operations divisions would be run by small businesses or microentrepreneurs. Although electricity and the primary energy used to generate it, whether or not

renewable, constitute the main targets of this strategy, the importance of the use of energy in transportation makes the participation of other stakeholders essential (such as municipalities, transportation company owners, and vehicle manufacturers).

THE STRATEGY IN A NUTSHELL

The new strategy focuses on the identification and consolidation of a set of complementary activities which, while bearing in mind the Bank's limitations, take advantage of its installed capacity and its experience in different sectors and spheres of action and allow it to: (i) differentiate its products, (ii) anticipate the trade-offs that will need to be resolved, and (iii) establish the criteria to define its position and keep it current in light of new developments in the sector and in the economies of the countries.

The Bank can draw on a wide variety of experiences, instruments, policies, and fields of activity to orchestrate a set of complementary activities and exploit its comparative advantages fully. That is, the Bank is an influential regional player with a proven ability to convene conferences, meetings and other forums for discussing important issues and reaching consensus. It has an excellent record of support for general reforms of the economy and the State that are prerequisites for energy sector reform, and for achieving regional economic and energy integration. It plays an important part in developing local capital markets. It has the capacity to provide financial and nonlending services to small-and medium-sized entrepreneurs. It is in a position to assist the private sector with loans and guarantees without sovereign backing. It is actively involved in urban development, rural development, the fight against poverty, the environment, and in energy-consuming sectors such as water supply and transportation. Lastly, the Bank has a network of Country Offices throughout the region that allow it to supplement its past experience in the energy sector with the input needed to adapt its services to the new circumstances. Of course, the Bank also faces major restrictions such as the paucity of resources available for the sector, both financial and operational; a lack of incentives

for maintaining its presence in this sector, aside from loan operations, and for undertaking processes that are complicated and costly in terms of staff input; and the relatively rigid nature of its operational procedures and financial instruments.

To provide effective support for the countries of the region within the limitations imposed by its overall priorities and restrictions the Bank must ensure that its actions take into account each country's ability to make the best possible use of the Bank's package of financial and other services. The role it plays should be catalytic but intended primarily to ease the transition. Both consolidation of reform and the development of new energy markets are long, complicated processes that call for the Bank's ongoing participation. Services must therefore be adapted to needs, and a process rather than project-oriented approach must be taken. This means priority should be assigned to projects that:

- are part of a strategy to consolidate sector reform mutually agreed upon with each country;
- encourage the development of new energy markets⁶ by identifying barriers to market development, applying innovative mechanisms and extracting maximum advantage from the potential for self-sufficiency and replication;
- provide an opportunity to contribute simultaneously to other priorities, such as equity, the fight against poverty, and environmental protection; and
- bring stakeholders together to develop approaches to problems of interest to several countries.

Many of the elements of the strategy consolidate actions that the Bank had already been taking in response to sector needs under the mandate of the Eighth Replenishment. It outlines ways to make them more operational, coherent, and effective. The linchpin of the new strategy is *support for the*

⁶In efficient use of energy, decentralized rural energy, facilities integrated with urban transportation, natural gas, and electricity.

development and consolidation of the sector reforms undertaken over the past 10 years by countries in the region. To provide it, the strategy proposes orchestrating all the instruments at the disposal of the IDB Group in a given country around a mutually agreed upon support program.

Second, the strategy seeks to provide comprehensive support for the development of *new energy markets* emerging as a result of the reforms, meeting their credit needs through the instruments and units best suited to the characteristics of each market.

Third, the strategy is based on an overall approach to energy problems that addresses both supply and demand. Hence the multidisciplinary and interdepartmental activities recommended in the search for comprehensive solutions to the complex problem of urban transportation.

Fourth, the strategy provides for the experimental use of new instruments to support the development of future energy markets through *programs that recognize the uncertain nature and importance of the process rather than individual projects, as well as the importance of the learning process in new areas.*

Fifth, recognizing the Bank's limitations and its priorities, the strategy recommends forming strategic partnerships with other multilateral and bilateral lending and technical assistance institutions as a way of supplementing its activities and avoiding overlaps.

To achieve its objectives, the strategy proposes using the following instruments:

- country dialogue and strategy;
- the Bank's ability to convene meetings and other forums to tackle common concerns, such as the integration of regional markets, and the challenges posed by climate change;
- responsive, timely sources of technical assistance to support the consolidation of reform and the development of the new markets;
- a menu of financial instruments serving the needs of the different markets;

- a menu of nonlending products linking the needs of borrowers and those of the financial institutions, especially for markets involving microenterprises, as well as small- and medium-sized businesses, and also individual consumer markets;
- close coordination among the different Bank units.

Implementation of the new strategy would give rise to a different type of operation involving all members of the IDB Group and would not be restricted to the energy sector as it has been known in the past. Apart from conventional and private sector operations, loans and technical assistance for energy companies, the strategy calls for credit operations and nonlending services for microenterprises and small- and medium-sized enterprises; energy components in loans for sanitation and municipal development; and operations offering comprehensive support for urban transportation and the environment. The strategy also proposes a new type of operation that is better able to adapt to constantly evolving markets, so that lessons learned during initial experimental phases can be incorporated into subsequent phases and replication enhanced. Lastly, the strategy encourages the well-orchestrated use of all available instruments in any of the IDB Group's units, to

provide effective, timely support for the consolidation of sector reforms.

The strategy would be implemented gradually and would include an initial stage for dissemination and experimentation; an intermediate stage for evaluation, consolidation, and reproduction; and a final stage for normal operation, evaluation, and feedback. In its initial stage, implementation of the strategy will involve reassigning functions and hiring additional staff to launch the new products and bring the Bank up to date, but eventually the number of staff required will depend on the level of activity in the sector.

The strategy outlined herein will allow the different instruments at the IDB Group's disposal to be used in a coordinated way, thereby enabling it to become a major source of support in the development of the energy sector in the region. Nevertheless, the extent to which this support translates into benefits for the countries will depend on their commitment to the sector and their ability to identify, jointly with the Bank, the appropriate response to changing circumstances and the adjustments required to keep their position updated in a sector continuously subject to change.

III. Highlights from the Region

MAJOR THEMES IN 1998

Environmental Strategies and Management

During the year, the Bank began work on a strategy to strengthen environmental management in Latin America and the Caribbean by co-sponsoring a special consultation on the subject with the Forum of Ministers of Environment of Latin America and the Caribbean. Organized by the Bank, the Pan-American Health Organization, UNDP, UNEP and the World Bank, the consultation engaged Bank staff and the participating ministers in a discussion of policy, and institutional and financial issues and options involved in fostering more effective environmental management in the region. The results of the meeting have helped determine the scope of the work now underway to prepare a new Bank strategy for environmental management that will be presented to the Board in 1999.

More concretely, several trends are creating the opportunity and need for heightened efficiency in the field of environmental management. The increased role of the private sector in the countries' economies presents challenges for environmental authorities in promoting new incentives and setting norms, standards and regulations, and enforcing compliance. The decentralization of environmental authorities to regional, municipal and/or sectoral levels of government requires capacity building and increases the possibilities for public participation and involvement. Finally, the increasing degree of regional, hemispheric and global economic integration and trade liberalization provides an opportunity for improved coordination and cooperation on transboundary environmental issues which are especially important in relatively small countries with shared resources and problems such as over-exploitation and contamination of water resources, air pollution, loss of biodiversity, and depletion of coastal and marine

resources.

In response to these environmental management challenges, the Banks' efforts during 1998 included several specific initiatives.

Strengthened Environmental Agencies and New Legislation

The Guiana region in the northern tip of South America encompasses perhaps the largest remaining undisturbed, pristine tropical rain forest in the planet. The region has supported a great diversity of endemic flora and fauna. Most of the region, which is very sparsely populated, has provided a traditional livelihood for Amerindians and black Maroon people. The area has been under serious threat from large logging companies attempting to acquire control over millions of hectares of natural forest. In addition, continued growth in large and small mining and encroachment by settlers are also threatening the area.

The institutions in charge of the protection and management of natural resources, particularly in Guyana and Suriname, have extremely limited resources and capacity for policy development, enforcement and program implementation. There has been a large effort by the donor community to support both governments in carrying out sustainable development plans for their natural resources. Examples of these initiatives include the Iwokrama International Rain Forest Program in Guyana and the Natural Central Suriname Nature Reserve Program. As part of the effort, the IDB continues to support the development of proper and efficient environmental institutional frameworks, and the implementation of environmental policies and regulations through nonreimbursable technical assistance.

In Guyana, the Environmental Management Agency (EMA) was established in 1996 through the Environmental Protection Act, and the actual implementation of the technical cooperation was initiated in 1998. The EMA's approach to organizational development is to maintain a lean organizational set-up with a core structure and strength to allow the agency to perform its mandate as stipulated in the Environmental Protection Act. An initial Strategic Plan for the EMA was developed with the participation of all key staff members. The plan defines the strategic direction for the EMA for the next 12-18 months. This includes increased awareness and understanding of the external environment and internal characteristics of the agency, a detailed work plan for the EMA, and the development of the Environmental Management Programme.

In Suriname, the government has initiated the implementation of the framework for environmental management by creating the National Environmental Council, a policy making body, and its operational arm, the National Institute for Environment and Development of Suriname (NIMOS). NIMOS will be responsible for the preparation and implementation of national legislation designed to protect the environment. The Environmental Management Program supported by the Bank has already been initiated, including staff recruitment, and preparation of the action plan for the technical assistance in training, and development of an umbrella legislation as well as an EIA system.

In Panama and El Salvador, the Bank's continued support contributed to the approval of new General Laws on Environment; now all the Central American countries have comprehensive environmental statutes. In Panama, the Bank's assistance helped to create the National Environmental Authority and will help to strengthen the management capacity of the environmental unit of the Ministry of Public Works. In Nicaragua, the environmental management capacity of government agencies in different sectors, including several ministries, will be strengthened with Bank support as part of the National System of Public Investments Program. In Guatemala, the environmental unit of the Ministry of Agriculture

will also be strengthened through a Food and Agriculture Sector Loan.

Valuing and Preserving Environmental Services

Traditionally, countries have failed to value the environmental services provided by ecosystems (fresh water, clean air, habitat, etc.) and to incorporate into the market system the mechanisms necessary to guarantee their conservation. In Guatemala, (with the approval of a Food and Agriculture Sector Loan) and in El Salvador (with the approval of a Water Sector loan), advances will be made on valuing the environmental services provided by forests and watersheds, and for investing resources for their management and conservation.

Roundtable on Instruments for Environmental Management

The effective and sustainable management of the environment and natural resources requires different types of instruments and mechanisms. Furthermore, new partnerships between the private and public sectors must be developed in order to meet the challenges of privatization, decentralization and globalization. This was the theme of a roundtable organized by the Environment and Natural Resources Management Division of Region 2 in October. Participants from several public entities and private organizations involved in environmental management in Latin America and other parts of the world presented and discussed experiences related to the implementation of economic instruments for effective environmental management, specifically focusing on applications in watershed management and water pollution control. The discussions touched upon the use of effluent charges and other market-based instruments, regional funds to promote clean production and technological innovation, and the role of monitoring and public disclosure of industrial environmental performance.

Natural Disasters: The IDB's Rapid Response for Reconstruction, Prevention and Mitigation

El Niño is an event which disrupts the ocean-atmosphere system in the tropical Pacific and can affect weather conditions around the globe. In general, impacts of an El Niño event include increased precipitation across the Eastern Pacific from the Pacific coastal areas of the United States to Chile, and decreased rainfall in the western Pacific including Indonesia and Australia. El Niño may occur every four to seven years and a typical event lasts for 14-22 months, or as long as there is warm water to sustain it.

The 1997/98 El Niño event in the tropical Pacific ocean caused economic and social distress throughout the Americas. The governments of Bolivia, Chile, Costa Rica, Ecuador, Panama and Peru declared states of emergency in affected areas to cope with anticipated drought, heavy rainfall, and flooding. Other countries in Central America and the Caribbean, such as the Dominican Republic, Haiti, and Jamaica also implemented measures to cope with these and other natural disasters.

In Argentina, flooding forced 100,000 people to leave their homes and caused losses of more than \$1 billion in farm output and \$750 million in infrastructure damage. In neighboring Paraguay, a similar number of people either lost their homes or belongings to floods. Damaged roads, bridges and embankments will cost \$40 million to repair. In 1997 the Bank extended loans totaling \$225 million to help Ecuador and Peru recover from El Niño related damage, and an additional \$335 million was approved in August 1998 to help Argentina and Paraguay. A \$300 million loan will support Argentina's efforts to repair and rehabilitate public transportation, housing, and infrastructure in six affected provinces. In Paraguay, a \$35 million loan will help rebuild roads, improve drainage and flood protection works; repair bridges and public buildings, and outfit shelters. Both programs have components to help develop better preventive and protective systems.

The countries of Central America, located at the eastern extreme of the Caribbean hurricane belt, are regularly hit with severe wind and intense rainfall. With mountainous terrain and complex river basin systems, floods, landslides, hurricanes and droughts can do serious damage to population and property, and these weather-related effects were exacerbated by the onset and aftermath of the El Niño climatic phenomenon. In two catastrophic months in 1998, the Central American countries were hit by a sequence of two hurricanes, Georges and Mitch, while the lingering effects of an unusual El Niño event had not yet been totally quantified or absorbed. The catastrophes left more than 12,000 people dead and 25,000 missing, unaccountable infrastructure and economic losses (in Honduras and Nicaragua, amounting perhaps to the equivalent of half of their annual gross national products by some accounts), and serious long-term impacts on the natural environment.

The Bank, responded immediately by preparing emergency loans and providing for flexibility in the application of funds from previously approved ones in order to meet the reconstruction needs of Honduras, Nicaragua, Guatemala, El Salvador, Haiti, and the Dominican Republic. Through the emergency and/or reformulated operations, Bank financing will contribute to infrastructure reconstruction, social capital revitalization, and the improvement of the local capacity to prevent and mitigate emergencies and natural hazards. Activities to be executed with IDB support include protection and rehabilitation of road networks, potable water, sanitation, energy and irrigation infrastructure, urban housing, health care and education services, and food supply.

The reconstruction and rehabilitation activities will include preventive measures to avoid or minimize the negative impacts of future disasters. These activities will be performed following environmental design considerations and improved safety measures, based upon land use plans reassessments and the delineation and zoning of vulnerable area.

A \$12 million Regional Recovery Fund for Microenterprise was established to mitigate losses

suffered by microlending institutions in the Central American countries devastated by Hurricane Mitch.

Finally, the World Bank, the International Monetary Fund, and the Inter-American Development Bank agreed to undertake a comprehensive assessment of the external debt situation of Honduras and Nicaragua and explore related requirements for debt relief.

Innovative Project Elements

Pilot Project on Forestry Incentives in Guatemala

The Food and Agriculture Sector Program in Guatemala supports a pilot project providing direct support for sustainable management and conservation of the natural forest. Under the pilot program, landowners in predesignated areas that are important to protect critical watersheds will receive direct payments roughly equivalent to the opportunity cost of keeping the land forested in an effort to “internalize the economic externality” of watershed protection. The program also includes the development and implementation of a National Water Resources Plan, which will establish an integrated policy and regulatory framework for the country.

Integrated Water Resources Management in El Salvador

Recent studies indicate that some 90 percent of El Salvador’s surface waters are contaminated and unsafe for human consumption without treatment. In 1998, a \$45.2 million loan was approved, incorporating for the first time in a Bank operation, the recently approved Strategy for Integrated Water Resource Management. The operation will promote the more efficient use of water resources through a combination of policy, institutional, and regulatory changes and infrastructure investments. The government will establish a financially independent agency charged with allocating water resources to ensure their proper management and conservation. At the same time, a modern regulatory agency and framework will be established for sanitation and water supply services. Financing will also be provided to rehabilitate and/or implement potable water and

sanitation systems and to help carry out a plan to promote decentralization, market based instruments for pollution control, private sector participation, and community involvement in water management decisions.

Water Quality in the Rio Pirai, Santa Cruz, Bolivia: The Importance of Information

The Rio Pirai watershed is one of the most important in the Department of Santa Cruz, Bolivia. Over three-quarters of the population of the department lives within its boundaries, with over 75 percent of departmental agricultural production and 90 percent of industrial activity concentrated there as well. The river serves as a source of domestic, agricultural and industrial water, as well as a sink for wastewater from the same uses. As population and human activity have grown in the watershed, so have concerns over water quality. Since 1987, significant fish kills during the summer months have become the norm. In spite of growing concern, the exact cause of the fish kills is not known, hampering efforts to reverse the trends.

Recognizing the importance of having solid data and information upon which to base decisions, the Bank, at the request of the Bolivian government, approved a technical cooperation that will provide the Prefectura of Santa Cruz with the equipment, knowledge and first year’s data necessary for planning pragmatic interventions for improving water quality. The operation will include validation and calibration of a basin water quality model, identification and classification of sources of pollution, and development of a long-term water quality monitoring plan.

Darien Sustainable Development Program

Paradoxically rich in natural resources and cultural heritage and poor in education, health, and household income, Panama’s Darien province presents a stark contrast between its world class biological and social endowments and the actual day-to-day struggle for survival of its inhabitants. Like many frontier regions, the Darien is characterized by rapid and chaotic colonization and exploitation of its resource

base. To address these issues, the Bank is supporting the Government of Panama in financing a sustainable development program to provide a foundation for future economic growth while safeguarding the region's unique biological resources and cultural heritage.

The program was developed through extensive consultation with those who live in the region, (including indigenous groups comprising 30 percent of the population), coupled with detailed scientific analyses of the region's biophysical characteristics. The resulting sustainable development program is built upon realistic and enforceable land use planning and institutional strengthening of the environmental authorities. This is being complemented by investments in water and land based transportation infrastructure, technical assistance to diversify production and increase local value added, institutional capacity building at local and municipal levels, and improved delivery of basic social services. Project implementation will be closely monitored and evaluated to extract lessons which could be applied in other countries.

The loan envisions long-term development based on land use planning, institutional capacity building, technical assistance to farmers, investments in infrastructure, and improved access to basic social services. The program is built around five core ideas:

- maintain the process of consultation and consensus building with the community;
- establish a rational sequence for executing the proposed projects and activities;
- simplify the criteria for land use management;
- optimize public intervention; and
- rationalize the institutional structure and improve interinstitutional coordination.

Operationally, the program revolves around a strategic plan for timing investments and activities, and is guided by a social and environmental sequencing matrix that sets out goals and milestones to be met before bids are called for projects with the most negative impacts. By adhering to the strategic plan

and sequencing matrix, the program is designed to ensure that measures to mitigate potential negative impacts—such as demarcating protected areas and indigenous lands, titling, and building the institutional capacity of the environmental authority—are carried out before the physical works are begun, and that all investments are consistent with the land use plan.

Brazil's National Environmental Fund: New Directions

The Fundo Nacional do Meio Ambiente (NFMA) in Brazil was established in 1989 as one of the first funds in Latin America to address a major challenge in environmental conservation: how to mobilize local resources to solve local problems. Since its inception, it has financed over 530 projects, totaling over \$30 million, mostly through local NGOs and community groups. The IDB initially supported the Fund with a \$22 million loan in 1992. Based on the encouraging results of the first phase, and the continued strong interest of the Government of Brazil to continue supporting the Fund, the IDB approved a second phase in 1998 with a \$24 million loan. A variety of small projects will be financed through grants for sustainable natural resource management and conservation, environmental education, conservation units, and applied research and technology development in natural resources and environment. The program also includes institutional capacity-building and environmental licensing components.

Phase II of the Bank support for the Fund incorporates a number of the lessons learned from the first phase, as well as from the experience of other environment funds throughout the region. Experience has shown that relying strictly on the demand-driven approach does not guarantee adequate coverage of problems that may be of national priority. This is not surprising, since so many environmental problems are rooted in the public nature of the benefits foregone, and the difficulties of internalizing the costs. Consequently, Phase II adds another window for financing projects, based on calls for proposals. Priority areas will be established by the Deliberative Committee of the Fund, whose representation will

also be broadened to include state level and academic interests, in addition to the five representatives of NGOs from throughout the country. This option allows the Fund to play a more dynamic, flexible and responsive role as one of the primary instruments of environmental policy in Brazil.

A CATALOG OF ENVIRONMENTAL AND NATURAL RESOURCE OPERATIONS

Thumbnail sketches of all investment operations approved in 1998 appear below, along with a selection of the most important or interesting technical assistance grants and loans.

Urban Environment and Pollution Control

ARGENTINA: Program to Support the Water and Sanitation Sector

The Bank approved a \$250 million loan for an innovative program to support reform in the area of potable water and sanitation by promoting investments by commercial banks. The program will set up two trust funds of \$100 million each to encourage supplementary investment by commercial banks in water and sanitation. A private bank will administer one of the trust funds, and the other will be administered by Banco de la Nación, a state commercial bank. The trust funds are expected to channel \$150 million in co-financing for the program.

The project will strengthen regulatory capacity at the provincial level, and facilitate the participation of private service providers in order to improve service quality and increase coverage. More than a million inhabitants in up to 100 localities will benefit from 280,000 new water supply or sewerage connections, and support will be provided for administrative, commercial, and operational improvements in 40 to 50 service enterprises. Approximately 10 regulatory agencies operating in the water resources sector will be strengthened. The total cost of the program, to be carried out by the Ente Nacional de Agua Potable y Saneamiento, is \$570.6 million.

ARGENTINA: Strengthening of the Water and Sanitation Regulatory Agency

The Multilateral Investment Fund will provide \$1 million in technical cooperation grant funding for the startup of the Water and Sanitation Regulatory Agency of Buenos Aires (ORBAS), including the development of its organizational structure, staff training, and the design of information and customer participation systems. A component of the program will strengthen the regulatory framework, including the development of a rate system and service quality control procedures, and will finance a workshop to share experiences in regulating the sanitation sector in Argentina.

BAHAMAS: Family Islands Potable Water Project

The Bank approved a \$14 million loan to the Water and Sewerage Corporation of the Bahamas to increase the efficiency and quality of potable water service in the Family Islands. The resources will finance investments to improve a total of 13 small potable waters systems in three islands: two systems in Abaco (Marsh Harbour and Treasure Cay), four systems in the southern part of Eleuthera, and seven systems in Exuma.

The Water and Sewerage Corporation will improve operations through a new customer information system and by the acquisition of new metering and related equipment. A strategy will be developed to manage pollution problems more effectively, and an information campaign will alert the public about the risk of using polluted groundwater.

BARBADOS: Solid Waste Management

A \$13 million loan will assist Barbados in the development of a modern, dependable, and efficient waste management system that properly protects the environment and improves the standard of public health. Both the Environmental Engineering Division and the Sanitation Service Authority will be strengthened, and private sector investment in waste management and reduction will be encouraged.

The construction of a waste management center for final disposal will contribute to redefine the roles and responsibilities of the public and private entities involved in solid waste management, as much as it also entails providing institutional strengthening and related policy reforms. The facility will include special waste management storage, processing and disposal areas, including segregated storage places for metals and tires, a yard waste composting facility and a sanitary landfill designed to maximize the protection of human health and the environment during operation. Environmental education and public awareness campaigns for waste-reducing activities are also envisioned.

BOLIVIA: Aguas del Illimani

This project is part of a long-term program of investments and actions designed to increase the water distribution and sewerage collection capacity of the La Paz and El Alto metropolitan region. It will be implemented under a thirty-year concession, granted to Aguas del Illimani by the Government of Bolivia, pursuant to a Concession Agreement dated July 24, 1997 between the Superintendencia de Aguas and Aguas del Illimani. The total cost of the Project is estimated to be approximately \$68.2 million with \$40 million in debt. The Bank will provide \$15 million of the financing and the remaining \$25 million will be provided with a parallel financing by the IFC and CAF.

The project consists of: (i) the increase of water production capacity in La Paz and El Alto; (ii) the supply of 100 percent water distribution coverage in La Paz; (iii) the installation of at least 71,752 water connections in El Alto; (iv) the installation of at least 38,000 sewerage connections in the La Paz and El Alto areas; and (v) the construction of a wastewater treatment plant in El Alto.

BRAZIL: Low-Income Neighborhood Improvement Program Habitar-Brazil

This \$250 million loan will support the federal government's efforts to raise the living standards of poor families in the substandard neighborhoods of

many urban areas. The program will bring about a direct improvement in the living conditions for approximately seventy thousand families now inhabiting makeshift housing in haphazard settlements. These families are exposed to high incidences of water-borne diseases and other environmental hazards, and lack basic services. The areas have a very negative impact on the surroundings and often encroach on environmentally-sensitive green spaces.

The investments coupled with community participation, will improve the physical situation of the neighborhoods and/or relocate families when necessary, enabling the full provision of water, sewage, garbage collection and social services (like health posts and community centers). The new urban development guidelines and municipal regulations fostered by the program (Municipal Strategic Plans for Subnormal Settlements) will, in the long term, help contain and reduce the spread of substandard settlements. The formulation and application of social and environmental evaluation methodologies for the projects financed may encourage more widespread adoption of similar approaches by federal, state, and municipal institutions and may ultimately contribute to the sustainable development of Brazilian cities.

BRAZIL: Municipal Development of Porto Alegre

The Bank approved a \$76.5 million loan to help improve public services and infrastructure in the city of Porto Alegre. IDB resources will finance the improvement of the efficiency of municipal agencies that provide sanitation and environmental control as well as road maintenance and safety services. Basic infrastructure in low-income neighborhoods will be upgraded through the construction of storm drainage, water supply and sewerage systems, and streets selected by the community will be paved. By the end of the program execution period, it is expected that the Municipal Department of Water and Sewerage will have increased its customer base and the Municipal Office of the Environment will be monitoring 150 industrial establishments with the highest pollution potential.

BRAZIL: Investment in the Water and Sanitation Sectors in the State of Goiás

The Multilateral Investment Fund approved a \$700,000 grant to the state of Goiás, to help create a new regulatory framework that will attract private investment in the water and sanitation sector and thereby improve service and coverage. The resources will assist the Empresa de Saneamento do Estado do Goiás and the Secretaria de Recursos Hídricos in establishing an independent, self-financed, state regulatory agency for the sector. The program includes the drafting of a plan that offers increased private sector participation in the management and provision of sanitary services in the state. A model build-operate-transfer (BOT) agreement, using the new Brazilian concession legislation, will also be developed.

COLOMBIA: Tibitó Potable Water Treatment

The Bank approved \$18 million in private sector financing for the rehabilitation of the Tibitó water treatment plant and 31 kilometers of the Tibitó-Casablanca water main in the city of Bogota. The result of the work from this loan, which will be made directly to the private company without government guarantees, will assure the availability of water for Bogota by restoring the plant and pipeline to their originally rated operating capacities. When completed, the project will help the city to meet a growing demand for water and to access reserves that will minimize the need for rationing in the event of an emergency. Bogota's municipal water authority, Empresa de Acueducto y Alcantarillado, awarded a 20-year concession to a group called Sociedad Concesionaria Tibitó to rehabilitate, operate and maintain the plant and pipeline. The project sponsors are VIVENDI (formerly Compagnie Generale des Eaux), Corporación Financiera del Valle and Fábrica Nacional de Autopartes. ABN-AMRO Bank will arrange the co-financing.

COLOMBIA: Cartagena Sewerage System

With a \$24.3 million loan, the city of Cartagena will improve sanitation conditions in areas whose drain-

age flows into Cartagena Bay. This project is part of a broader program that will eventually expand and enhance the city's water and sewage systems by building a sewerage treatment and final disposal system. The current IDB loan will help finance sewer construction in southwest Cartagena, home to low-income residents, where 7,000 individuals will receive sewer service following the expansion. The resources will also be used to improve sewer service quality in the Bocagrande district, where many of the city's hotels are located, by upgrading and expanding the current system. The program will also finance the construction of collector sewers and pumping stations to channel wastewater into an underwater outfall in the bay, after it has been treated with chlorine.

COLOMBIA: Socio-Environmental Program for Suba

Suba is one of twenty subdivisions of the Capital District of Bogota. Half of its one million population lives in extreme poverty. Once on the periphery of Bogota, the rapid urbanization of Suba has exacerbated soil, air and water pollution and their adverse impact on human health. Suba does not have adequate health centers to treat some of the more prevalent afflictions, including acute respiratory infections and skin diseases. The objective of this \$350,000 technical cooperation is to help improve the living conditions of families in Suba through a health assistance program and an environmental action program. FANA (Fundación para la Asistencia de la Niñez Abandonada) will be in charge of the programs.

EL SALVADOR: Water and Sewer Program

To promote more the rational and efficient use of water resources and greater investment in water and sanitation services, El Salvador will draw upon a \$43.7 million Bank loan. The financing will facilitate the establishment of a financially independent regulatory agency responsible for oversight and policy-making to ensure the proper development and preservation of water as a natural resource. In addition, the program will create a modern regula-

tory framework for services in the sanitation and water supply sector. More efficient and financially viable public, private, and semi-private operators of water and sanitation services will be established through a decentralization and reform process, and transparency and competition will be promoted at all levels among service providers. A component of the program provides for investments in rural water and sanitation systems that are independently managed by local communities.

In a related financing, the Multilateral Investment Fund approved a \$2.4 million grant for technical cooperation to support decentralization, privatization, management restructuring and the formation of a new regulatory framework as well as a new regulatory agency for water and sanitation services. Four government agencies will carry out the program.

HAITI: Potable Water and Sanitation Sector Improvements

Haiti received a \$54 million loan for a program to improve potable water and sanitation services and to establish a regulatory framework for the development of a wastewater service. The project will facilitate efforts to reform the potable water and sanitation sectors, establish an independent regulatory agency and privatize the provision of these services in Port-au-Prince and other urban centers. The quality and coverage of potable water services in 10 urban centers and fifty rural and peri-urban communities will be enhanced. An investment component will finance the rehabilitation and expansion of water systems, and another component will foster private sector participation in the management of rehabilitated systems.

A \$965,000 technical cooperation has been designed as an integral part of the program to concentrate on the regulatory aspects of the reform. The program provides for the use of MIF resources to support three components: (i) preparing the main regulatory instruments prescribed by the draft sector reform law; (ii) supporting start-up of the Commission de Regulation des Services d'Eau Potable et

d'Assainissement (CREPA) by establishing its information systems and training key staff; and finally, (iii) strengthening the environmental capacity of the sector, including CREPA, the technical capability of service providers, and the awareness of users.

HONDURAS: Technical Assistance to Decentralized Service Providers in the Water and Sanitation Sector

Through a \$450,000 nonreimbursable technical cooperation, the IDB is supporting the design of a national Water and Sanitation Investment Program under preparation by the Comité Técnico Interinstitutional, established by the Government of Honduras. The Investment Program aims to consolidate reform while investing in much-needed rehabilitation and service expansion projects. Investments will be made through a series of projects for decentralized service providers, which can be groups of municipalities or entities with management independence. Investments will be in potable water supply, wastewater, and refuse disposal. Institutional strengthening, asset management, training, and public education will be essential components of each project.

JAMAICA: Institutional Framework for Integrated Water Resources Management

With resources from the Netherlands Environment Trust Fund, the Bank approved a \$100,000 technical cooperation to propose an institutional and legal framework for integrated water resources management and a short- medium- and long-term action plan for its implementation. The opportunities where the Bank could collaborate in support of its implementation will be identified. Similar operations were approved for Costa Rica, the Dominican Republic and Honduras.

MEXICO: Sustainable Water and Sewage Systems in Rural Communities

Financing of \$310 million for this program will enable the improvement of water and sewerage

services and systems in rural communities. The resources will support the implementation of decentralization processes that separate and strengthen different sectoral functions and improve institutional mechanisms in approximately 20 states and 200 municipalities. An important component of the program is promotion of the active participation of all groups in the community, particularly women and indigenous groups, in system planning, design, construction, operation, and maintenance. Infrastructure for water and sanitation will be either built, rehabilitated, or expanded in low-income rural communities of up to 2,500 inhabitants. The program will provide financing to water supply systems in approximately 1,200 communities and sanitation solutions in 950 communities.

MEXICO: Aquifer Recharge Studies

Overexploitation of groundwater storage in Mexico City over the years has led to increased land subsidence and deteriorating groundwater quality. To address these problems, the Federal District Department's Environment Secretariat and the National Water Commission have decided that studies must be conducted immediately to assess, by way of a strategic water resources management plan, the viability of recharging aquifers in the Metropolitan Area of the Valley of Mexico. In response, the Bank approved a \$960,000 grant from the Japanese Trust Fund for Consultancy Services for developing the analysis. It will assess the viability of aquifer recharge, include prefeasibility studies for priority integrated rainwater management projects, and design an aquifer recharge pilot project. The project will be undertaken in conjunction with a reforestation program now being funded partly by the Overseas Economic Cooperation Fund of Japan and with other projects planned by the Federal District.

VENEZUELA: Program to Support Decentralization of the Potable Water and Sanitation Sector

Venezuela began decentralization in potable water and sanitation when the *Instituto Nacional de Obras Sanitarias* was sold off in 1991. During the transi-

tion, the decentralization process ran into several problems and service deteriorated. The recent financial crises in the country (and the sector) has forced the central government to carry the decentralization process even further, by adopting strategies centered around local initiatives, under the leadership of state governors and mayors. The idea is to create mixed autonomous companies, owned by both the municipalities and the states.

The objective of this \$100 million loan is to improve the quality and increase the coverage of water and sanitation services by establishing efficient and functionally autonomous companies that deliver quality services to the public. The program's specific objectives are to consolidate decentralization of the sector, create efficient and optimally sized service operator companies, and promote private sector participation in the newly created companies.

The program, to be carried out by *Hidroven*, will finance activities having an immediate impact on the quality of service, including institutional strengthening (administrative and accounting systems) and rehabilitation of infrastructure (e.g. metering systems), as well as major works, such as wastewater treatment plants and new sewer mains. New service companies, with private sector participation and local autonomy, will be created following applications by states and municipalities for assistance in setting them up.

Natural Resources Conservation and Rural Development

BRAZIL: Nature Conservation in Tocantins

The objective of this \$750,000 technical cooperation is to promote the conservation of natural resources in the Cantao region, which contains several endemic species and is one of the largest wetlands in South America (after the Pantanal). The long-term goal is to establish the Cantao area as a major ecological reserve capable of attracting visitors from around the world, contributing to the sustainable economic development of the region. Studies will develop a comprehensive profile of the park ecosystem and

surrounding areas. Management plans will be required for the operation of the park and surrounding state protected areas. A component of the program will provide training courses in conservation management and ecotourism.

GUATEMALA: Support for Restructuring of Food and Agriculture Production

This \$33 million operation is designed to increase the competitiveness of the food and agriculture sector and thereby bolster its contribution to sustainable economic growth and poverty reduction. The program provides support to the government in managing the restructure of the Ministry of Agriculture and Food (MAGA), and for developing policies and legal framework for the comprehensive management of water resources. It also includes funds to compensate landowners in strategically wooded sites areas for the environmental services (externalities) of sustainable forest management. Support for this forestry pilot program amounts to \$12 million.

PANAMA: Darién Sustainable Development Program

The objective of this \$70.4 million loan is to contribute to the social development, sustainable production, management, and protection of natural resources of the region. The specific objectives are to establish an effective land use management plan consistent with the characteristics of the resource base, reduce the rate of deforestation, resolve land and resource conflicts, and stabilize land use patterns along the frontier. The program will strengthen the capacity of administrative management, local supervision, and indigenous community groups. A component of the program will rehabilitate the transportation network, in a manner consistent with the land use management plan.

REGIONAL: Biodiversity in Andean Tropical Countries

To promote the conservation of biodiversity and the sustainable use of ecosystems in tropical areas, a \$740,000 grant from the Japan Special Fund will

support and accelerate the development of national biodiversity strategies in five Andean countries (Bolivia, Colombia, Ecuador, Peru and Venezuela). This process involves specialized studies, workshops, and a structured regional dialogue to design a biodiversity strategy and action plan that will be consistent across the Andean nations.

Coastal Zone Management

BRAZIL : Coastal Zone Management

The Bank approved \$1.75 million in non-reimbursable financing in local currency to help establish a coastal zone management program in Brazil for 120 kilometers of coastline between Tamandaré, in the state of Pernambuco, and Paripueira, in the state of Alagoas. The resources will help launch Brazil's first locally administered coastal management program designed to reconcile and integrate land development processes with marine conservation priorities. A local committee for coastal management will be established, bringing together local governments, resources users, and local nongovernmental organizations.

A zoning and management plan for the marine protected area will be prepared. The capacity of local governments for environmental protection will be strengthened, and educational activities will be financed to promote marine conservation. The program, to be carried out by the Fundação Mamíferos Marinhos along with other partners, will also include community-based demonstration projects in reef restoration, municipal reserve management and wildlife protection. A management strategy for sustainable artisanal fisheries in both coastal reefs and mangroves will be developed. Community-based organizations dependent on coastal resources will be strengthened, and conflict resolution techniques will be applied to resolve issues of municipal land development.

GUYANA: Training in Coastal Zone Management

The purpose of this \$150,000 technical cooperation, expected to make a contribution to coastal zone management (CZM) and conservation, is to raise awareness and support for long-term solutions to erosion and the need for shorezone management. The program is expected to make a contribution to CZM and conservation by improving staff training and by promoting personnel capacity and community participation. The immediate objective of the project is to prepare and execute a short-term training program for CZM in Guyana, which will involve both public officials and affected communities. The mid-term objective is to prioritize the needs and areas of future interventions for sustainable CZM. The long-term objective is to develop a training program that incorporates the basic elements for initiating a national CZM program.

HAITI: Coastal Marine Protection

Sound coastal management is critical to Haiti's future. Not only are the country's beaches a valuable tourism asset, but more than 90 percent of the population lives in coastal areas or in adjacent watersheds and obtains at least part of their protein intake from seafood. This \$440,000 grant will support the initial steps toward a nationally integrated coastal management program. The resources will be used by the Ministry of Environment to establish a demonstration area database, and increase the capacity to monitor coastal resources. Participatory planning activities involving coastal communities will be carried out, including a pilot project. Follow-up investment projects will be identified by preparing a preinvestment plan.

Energy

COSTA RICA: Miravalles II Geothermal Power Plant

A loan totaling \$49.5 million will finance a 27.5 megawatt geothermal power plant. This is the first private sector energy project in Costa Rica under-

taken on the basis of a build-own-transfer contract awarded through competitive bidding. The project is also the first in the country to encourage private investment in the energy sector under the terms of a 1995 amendment to the Independent Power Generation Act.

The financing consists of a \$16.5 million loan from the IDB's ordinary capital and a syndicated loan of \$33 million co-arranged and underwritten by The Fuji Bank, Limited. Two additional banks, Dresdneo Bank and *Credit Local de France*, have joined Fuji Bank to subscribe the syndicated loan. The borrower, *Geoenergía de Guanacaste, Limitada*, is contributing \$16.5 million in equity. The project sponsors are Florida-based Oxbow Power Corporation and Marubeni Corporation. The power plant will sell its entire electricity output to the *Instituto Costarricense de Electricidad*, the Costa Rican public electricity utility, under a 15-year power purchase agreement.

Environmental Funds and Information Systems

BRAZIL: National Environmental Fund, Stage II

Based on the encouraging results of the first phase of this fund, and the strong interest of the government in its continued operation, the IDB approved \$24 million second phase loan to be followed by \$21 million more if specific goals are achieved. The program has three related components involving investments in specific projects, institutional strengthening for the executing agency and project proponents/beneficiaries, and support for an environmental licensing system.

REGIONAL: Environmental Fund to Promote Biodiversity

The Multilateral Investment Fund approved a \$4 million equity investment in Terra Capital, a fund that will support small businesses that have a positive impact on biodiversity in South America. A new company, Terra Capital Advisors, will be established in Brazil to provide investment management services

to the fund. The sponsors of the project are Banco Axial, S.A. and Sustainable Development Inc., both of Brazil, and the Environmental Enterprises Assistance Fund of the United States.

The fund, expected to reach up to \$25 million, will stimulate economic development, create jobs, and yield attractive returns. It is supported by the International Finance Corporation, the Swiss government, and private investors. The Global Environment Facility is expected to provide grant resources to meet the Fund's biodiversity technical needs.

REGIONAL: Environmental Funds: Experiences and Future Directions for the IDB

The Bank approved a \$100,000 technical cooperation with resources from the Netherlands Environment Trust Fund that will analyze the possible role and effectiveness of environmental funds as a financial mechanism to improve environmental quality and natural resources management. The technical cooperation will focus on financial and governance issues in the establishment and management of two types of funds: (i) public environmental funds, designed primarily for the generation of public goods; and (ii) environmental enterprise funds for business opportunities by the private sector. Building on the lessons of previous Bank operations, the future financing role of the IDB Group will be analyzed in light of the opportunities and constraints presented by the different types of funds.

BOLIVIA: Water Quality in the Rio Pirai, Santa Cruz

At the request of the Bolivian government, the Bank approved a \$198,000 technical cooperation that will provide the Prefectura of Santa Cruz with the equipment, know-how and data necessary for planning pragmatic interventions to improve the water quality of the Rio Piari watershed. The operation will include validation and calibration of a watershed water quality model, identification and classification of sources of pollution, and development of a long-term water quality monitoring plan.

Environmental Institutions and Management

BAHAMAS: Strengthening of Public Utilities and Environmental Regulation

The government of The Bahamas recognizes the need to improve utilities regulation and strengthen environmental management before moving ahead with the economic liberalization and structural adjustment program begun in mid-1993. The Multilateral Investment Fund approved a grant of \$1.3 million to enable two regulatory agencies (the Public Utilities Commission and the Environment, Science, and Technology Commission) to become fully operational and effective. The need for strengthening environmental management is made more urgent by the impending privatization of selected utilities. The project is designed to establish a fully developed legal and regulatory framework for the energy, telecommunications, water and sewerage, and solid waste sectors. It will also help strengthen the institutional capacity for managing and enforcing environmental protection policies and measures.

CHILE: Program for the Development of Environmental Policies, Plans, and Programs and Improving of Planning Capacity at the Municipal Level

Municipalities are potentially a good point of entry for developing environmental management models that can work. However, conspiring against devolution are a dearth of trained staff, limited local improvement programs, inadequate environmental education, and a weak funding base, any of which can constrain the ability of municipalities to take on programs for environmental protection, improvement, and mitigation.

The *Centro de Estudios Económicos* (CEDE) will develop mechanisms for identifying practical environmental strategies that are workable at the municipal level and elicit public participation in environmental planning. Resources from a \$255,000 non-reimbursable technical cooperation will finance a diagnosis of environmental problems and priority-setting with input from three selected communities.

Using alternative environmental scenarios, the operation will support the design of policies, projects and programs that emphasize community involvement. Medium-range (five year) environmental impact scenarios will be developed in each community based on planned investment outlays and municipal programs. An institutional review of environmental policies and existing instruments, and how they relate to the problems identified will also be undertaken. Instruments and programs will be selected for overcoming the problems and devising an environmental mitigation and improvement program for the community.

CHILE: Strengthening Environmental Dispute Settlement System

The Bank approved a \$149,000 technical cooperation that will analyze the system of Environmental Impact Assessments (EIAs) to see how best to strengthen its environmental dispute settlement functions. The technical cooperation will yield recommendations for including specific procedural requirements in the EIA system to adequately address conflicts that may arise or deepen during the EIA process. These recommendations will be based on an analysis of selected case studies of recent investment projects where certain factors contributed to the success or failure of the EIA system in terms of resolving environmental conflicts.

SURINAME: Environmental Management

The Bank approved \$1.38 million in nonreimbursable financing to strengthen and support the initial operations of the National Institute for Environment and Development of Suriname. The resources will finance technical assistance and staff training during the first two years of the institute's operations, focusing on the mining and forestry sectors. In addition, support will be given to establish operational capacity in the institute's initial organizational structure. Environmental legislation and regulations, including a system for environmental assessment and monitoring, will be developed as well. Four studies will be financed including a regional strategic plan for the Greenstone belt (an area of small-scale gold

mining), an environmental plan for the forestry belt, the development of key geographic information system activities, and an environmental review of specific case studies.

REGIONAL: Private Sector and Environmental Management

With resources from the Swiss Trust Fund, the Bank approved a \$120,000 technical cooperation to finance consultancy services that should provide a strategic context for cost-effective use of Multilateral Investment Fund (MIF) resources and mechanisms to facilitate a leadership role for the MIF in promoting environmentally sound private sector activities and investments in Latin America and the Caribbean. In recent years, the MIF approved several private sector operations related to the environment but it currently lacks a coherent strategy to guide its activities in support of this role for the private sector. In order to assist in the development of such a strategy, the consultants will carry out surveys to determine areas for potential MIF projects (e.g. equity, venture capital, regulatory reform, management training, SME business development services, etc.) that can strengthen environmental business opportunities and/or enable firms to improve their environmental performance. The strategy work would also provide model project abstracts for future operations and activities related to the private sector and environment.

REGIONAL: Trade and Environment: the Case of *Mercosur*

With support from the Argentine government, the Bank approved a \$90,000 technical cooperation with resources from the Netherlands Environment Trust Fund that will support *the Mercosur Working Group on the Environment* ("Working Group 6") in the further development and implementation of its work plan. The overall objective of the technical cooperation is to contribute to making trade and environment mutually reinforcing in the regional context through the initiation of a permanent dialogue on the issue between governmental, academic, business and NGO leaders. To reach this objective, trade liberalization

processes and environmental regimes in the region will be reviewed with a special focus on *Mercosur*. A comparison between the EU, NAFTA, and *Merco sur* bodies, decision making procedures, in force norms, and dispute settlement mechanisms will be prepared as well as a broad hemispheric contextual study. In particular, the project will analyze the application of the process of the “Winnipeg Principles on Trade and Sustainable Development” to trade and environment decisions in developing subregional and regional economic integration initiatives. The purpose is to support sustainability objectives in LAC trade agreements and institutions (*Mercosur*, Andean Pact, CARICOM and CACM).

Natural Disasters

ARGENTINA AND PARAGUAY: El Niño Emergency Loans

The Bank approved two loans totaling \$335 million to assist recovery and reconstruction in areas of Argentina and Paraguay that were affected by disastrous floods caused by torrential rains associated with the El Niño climate phenomenon. In November 1997, the Bank approved \$255 million in financing to help Ecuador and Peru prevent and mitigate damage caused by El Niño, but the 1998 loan for \$300 million to Argentina is the largest loan ever devoted to this purpose.

DOMINICAN REPUBLIC: Hurricane Georges Emergency Recovery Program

A \$105 million loan and a \$750,000 technical cooperation grant were extended to the Dominican Republic for reconstruction and relief following the damage of Hurricane Georges. The resources will assist in rebuilding social and productive infrastructure, especially in low-income communities where the hurricane took a heavy toll. The program will also accommodate activities related to disaster

prevention, land-use planning, and the rational use of natural resources. Technical assistance will be provided for institutional strengthening of the coordination, management, and control mechanisms planned for carrying out the program.

GUATEMALA: Emergency Support Program for Natural Disasters

The Bank approved a \$40 million loan to Guatemala for reconstruction and repair of public works that were damaged by both the flooding caused by the El Niño phenomenon earlier this year, and by the devastation left behind by Hurricane Mitch. It will also contribute to the formulation of flood prevention measures.

The program will help finance drainage works in rural and urban areas, cleanup, canalization, and riverbank protection to prevent flooding, as well as rehabilitation of drainage ditches and sewerage systems, road improvements, repair and rebuilding of bridges, and the protection of schools and historic archeological sites. Additional rehabilitation and permanent rebuilding operations under the program will be determined by the Bank and the borrower in such areas as transportation, sanitation, and other basic sectors.

PERU: El Niño Rapid Early Warning System Demonstration Project

Although the meteorological service and disaster relief agencies of Peru, such as the *Instituto de Defensa Civil* are monitoring the El Niño phenomenon, they would benefit from a rapid early warning predictive model that could identify the more vulnerable areas. This \$150,000 technical cooperation aims to support the application of such a model, on a demonstration basis, to two priority areas in Peru, based on remote sensing radar imagery and Geomatics technology.

IV. Cooperation for Sustainable Development

In an effort to serve its clients better by staying abreast of cutting edge issues and engaging in inter-institutional collaboration to avoid duplication, the Bank works closely with other entities involved in environmental work, exchanging mutually beneficial information, ideas and proposals. Over the years, the level of cooperation and networking between the Bank, agencies in its member countries, and other international institutions, intergovernmental agencies, corporations, NGOs, and independent experts has expanded to embrace a number of new areas of research, reform, and lines of action. This chapter highlights the past year's experiences involving cooperation over a broad range of environmental issues, many involving familiar, ongoing themes and some dealing with less well known or more recent topics.

INTEGRATED WATER RESOURCE MANAGEMENT

As a part of an integral watershed approach to the management of water resources, Bank staff engaged in various activities to disseminate the strategy for integrated water resources management. These included participation in conferences and workshops and cooperation with other agencies and member countries. The emphasis of the Third IILA International Workshop on Watershed Management for Central America held in Turrialba, Costa Rica in November was on the formulation of watershed management project. The Conference of Water for Sustainable Development and INBO (International Network of River Basin Organizations) Workshop consisted of a series of meetings organized by the government of France in preparation for the UN Conference on Sustainable Development held in 1998.

The Global Water Partnership (GWP), an organization established in August 1996 with funds from the

World Bank, UNDP and the Swedish Agency for Development (SIDA), the Brazilian Water Resources Association and the IDB, held a meeting in Vitoria, Brasil in November 1997 (sponsored by SIDA and the IDB), which led to the creation of the South American Technical Advisory Committee (SAMTAC) of the GWP. This technical group already presented a work plan to accelerate the process of integrated water resources management in the region. The Environmental Division supported GWP/ SAMTAC's principles at a meeting held in Buenos Aires, Argentina, in March, and meetings in Granada and Salvador, Brazil, held in October and December, 1998.

Understanding how water resources are managed and how management can be improved is one of the keys to implementing the principles of the Bank's water resources strategy in projects and policy reforms that the Bank finances. On September 10, a draft proposal for an Analytical Framework for the Assessment of Institutional Frameworks for Integrated Water Resources Management for Project Teams was presented to IDB staff by consultants of the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) of Delft, The Netherlands. The purpose of this workshop was to discuss a set of recommendations and conclusions for finalizing guidelines in this area.

Strategy implementation also includes the design of a basin or region-wide water pollution control program, which falls into the difficult and overlapping domains of applied natural systems and economic analysis. The *Workshop on Economic Analysis of Water Quality Improvement Investments* held in March elicited suggestions from IDB technical staff about which pivotal issues should be incorporated in a good practice paper that is currently under preparation. This paper is part of the elements needed to build an operational bridge between the

principles of the Bank's water strategy and the features of actual projects that reflect them. The bulk of the study was drafted in 1998, and will be issued in 1999.

Finally, in September the IDB Country Office in Honduras and the El Cajón, Watershed Management Program, organized a three-day event at the Central American Development Bank in Tegucigalpa to discuss natural resource and watershed management. The objective of the meeting was to combine innovative, state-of-the-art knowledge with lessons learned from IDB-sponsored natural resource management projects in Central America, and the Dominican Republic. There were some 180 participants from the executing units of IDB-financed projects, central and local government representatives, and representatives of the private sector and NGOs.

Four presentations were made by IDB staff. The first one showed that the principles of sustainability, democracy and justice are the centerpieces for successful interaction between man and nature. The second discussed the operational framework for watershed management programs. The third dealt with the role of economic considerations in watershed management. The last presentation discussed financial incentives in natural resource management projects. The event was extremely successful and a similar meeting may be held in Guatemala in 1999.

URBAN ENVIRONMENT AND POLLUTION CONTROL

Urban Greening

In response to a growing trend toward regional coordination in urban areas which links environmental protection with the maintenance of green spaces, the SDS Environment Division organized a forum on Urban Greening in October. IDB staff members and invited guests from the private and public sectors, NGOs, and municipalities participated in the half-day meeting. Participants discussed strategic elements of urban planning, and the good practices for urban greening (see 1997 publication Good Practices for Urban Greening). They also considered the

design, development, implementation and maintenance of urban greening initiatives and viable financial mechanisms for these programs. The Urban Agriculture Network presented urban agriculture experiences from around the world. Practitioners from the State of Mexico and the municipal government of Mexico City discussed the outcome of the \$200 million Ecological Conservation Program of Mexico City financed by the Bank.

Cleaner Production and Pollution Prevention

On September 23, 1997, the Bank approved a regional technical cooperation for the organization of a training-of-trainers course in cleaner technologies. This project was executed by the Inter-American Association of Sanitary Engineering and Environmental Sciences. The course was held in October 1997, in São Paulo, Brazil with the participation of professionals from institutions that are involved in the preparation and/or execution of Bank loans for pollution control. The training was very successful and many countries in the region have demonstrated an interest in a follow-up course.

In 1998, cleaner production was discussed at the Cleaner Production Conference of the Americas: Building a Roundtable for Hemispheric Cooperation, held in August, 1998, in São Paulo. The Conference advanced the goals of the 1994 Summit of the Americas Partnership for Pollution Prevention by seeking to improve environmental and institutional performance. The event was organized through a partnership among several organizations, including the IDB, São Paulo State Environmental Technology Company, U.S. Environmental Protection Agency, U.N. Environmental Programme, Environmental Canada, the World Bank, the Organization of American States, the Ministry of Science and Technology, the National Pollution Prevention Roundtable, and the University of São Paulo. The principal purpose of this conference was the design of a cleaner production strategy for Latin America and Caribbean.

The event included discussions of the barriers, challenges, and opportunities for cleaner production

in the hemisphere. It was also used to develop joint actions among the various individuals and institutions involved with cleaner production and pollution in the region through the development of a communications network and the articulation of priority needs for follow-up. The conference was structured around a series of interactive sessions on key themes relating to cleaner production and pollution prevention. This format facilitated dialogue and information exchange among the institutions and professionals and brought to light innovations, issues, and opportunities that could be incorporated into a Regional Cleaner Production Strategy and Roundtable for the Americas.

Currently, the Bank is involved in promoting ecologically sustainable industrial development by refining the training techniques and materials used for the 1997 pilot course on cleaner production and by contributing to the design of a cleaner production strategy for Latin America and the Caribbean.

NATURAL RESOURCES CONSERVATION

Directions for Forest Policy and Financing in Latin America and the Caribbean

The sources of deforestation are many and the causes often lie outside of the forest sector, so the solutions often are to be found in multisectoral policies. Therefore, it is understandable that projects that treat forests and forestry in isolation have been gradually disappearing and forest related investments have been incorporated into broader natural resource management, rural development, and environmental programs financed by international development agencies like the IDB and the World Bank.

In the Workshop on International Cooperation and Financial Resource Mobilization in Latin America held last June in Santiago, Chile, participants analyzed instruments for forest financing, including the prospects for a wider use of the Clean Development Mechanism for Latin America. They also identified ways to coordinate the execution of national forest program at both the national and regional levels. Other aspects of forest policy were

analyzed at the Expert Consultation on Forestry Policy in the Caribbean: Strengthening Countries' Capacity and Effectiveness held in Port-of-Spain, Trinidad and Tobago from May 25 to 28. At this meeting, forest policy documents, financed by the Economic Community and carried out by consultants hired by the U.N. Food and Agriculture Organization, were reviewed for all 22 Caribbean countries and territories. Constraints and opportunities for sustainable forestry were identified on the basis of the policy situation, and future directions were mapped. Finally, the First Latin American Congress of the Forest Research Organizations, the most important regional forestry event of 1998, covered six themes, varying from forest management practices to conservation. The presentation by the Bank's Environment Division was in the area of forestry policies, based on a series of comprehensive studies just released in *Forest Policy Practices*, a publication of The John Hopkins University Press and the IDB (see Chapter V).

A workshop on the use of forest incentive systems in El Salvador and Guatemala was organized in Washington, D.C., as a cooperative effort between the Bank's Region 2 Operations Department and the Sustainable Development Department. The presenters included private consultants, former USAID officials, and IDB staff. The workshop concluded that the implementation of incentive systems should be preceded by the rectification of perverse policies that have resulted in deforestation. Furthermore, incentive mechanisms may vary from country to country, and it is difficult to establish generalized criteria. However, if direct incentives are used they should be temporary, targeted and cost effective.

Inter-American Biodiversity Information Network (IABIN)

An Action Plan for Sustainable Development emerged from the Summit of the Americas, held in Santa Cruz, Bolivia, in December 1996. Initiative 31 of the Summit called for the establishment of an Inter-American Biodiversity Information Network. The OAS Unit for Sustainable Development and the Environment, in its coordinating role for Summit

follow-up, provided funding to host two expert meetings to formalize the IABIN concept. The Bank participated at the second meeting, held in January in Washington, D.C., and has met with staff of the U.S. Geological Survey, which is supporting the IABIN preparation process.

Financing Biodiversity

Finding adequate financing for environmental conservation and sustainable use of natural resources is a challenge because of the misconception among many in the financial and political community that the value of nature conservation is low. This perception is linked to nonexistent or ill-defined property rights, and insufficient knowledge about biodiversity and its socioeconomic value. The public goods aspect of environmental services require governments to play an active role in formulating incentive and regulatory frameworks which will assign conservation a higher priority than it has currently. In 1998, the Bank funded a study on biodiversity financing, and in December organized a seminar which included the participation of Bank staff, and representatives from the private sector, the IFC, and several NGOs.

COASTAL ZONE MANAGEMENT

On September 22, the Bank publically unveiled its new *Strategy for Managing Coastal and Marine Resources in Latin America and the Caribbean* at an event held at Bank headquarters and co-hosted with the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. The new IDB strategy, which articulates an integrated focus for marine and coastal development and provides a guide to the basic principles for conservation and resource management of coastal areas, is the result of two years of research and consultations among experts in Latin America and the Caribbean which was coordinated by the Environment Division of the Sustainable Development Department. Among the organizations collaborating with the IDB in formulating the strategy and conducting preparatory research were the Inter-American Center for Sustainable Ecosystems Development, the Nature World

Union Regional Office for MesoAmerica, Imariba, and the Coastal Resources Center of the University of Rhode Island. Participants at the event included distinguished researchers and consultants from the IDB and other organizations that contributed to the work.

In strategy outreach and dissemination efforts, a representative of the Environment Division participated in the Caribbean Sea Forum held in Trinidad and Tobago in June and in the Regional Seminar on Integrated Coastal Management in the Wider Caribbean held in Cartagena, Colombia, in September.

ENERGY AND CLIMATE CHANGE

Energy

Around the globe, approximately two billion people are without access to electricity services and as many as a billion more are poorly served by their electricity systems. International development institutions, including the World Bank and the IDB are actively engaged in providing technical assistance and financing investment activities designed as models for sustainable energy development. While access to electricity does not in itself assure social progress or economic development, it is an essential element of both.

A leading Bank energy expert made two important presentations during 1998. The first was on the modernization of the electric sector and was delivered in February at a meeting for Ecuadorian journalists. The second presentation took place during Energy Week 98: Extending the Frontier to Reach Energy Business for the World Bank. The objective of this annual meeting of the World Bank was to broaden the understanding of participants about the range of energy projects being undertaken by different energy groups.

Village Power '98 dealt with renewable energy solutions for rural communities throughout the developing world. The U.S. National Renewable Energy Laboratory (NREL) convenes the conference every 12 to 18 months in Washington D.C. This year

the World Bank joined NREL to organize and host *Village Power '98* at World Bank headquarters in October. The theme was Scaling Up Electricity Access for Sustainable Development. At the meeting an IDB representative made a presentation on rural energy activities.

The Bank also participated in the colloquium, Global Electricity after Kyoto, a meeting organized by the World Bank and E7 (a group of major utilities in developed countries). This was a premier gathering of international organization officials, utility executives and senior government officials who are positioning themselves to respond to the issues and challenges raised in the Kyoto Protocol. The encounter highlighted the efforts of the global electric utility community to forge new cooperative partnerships and to propose innovative initiatives.

Climate Change

The Third Conference of the Parties of the Climate Change Convention took a large step forward with the adoption of the Kyoto Protocol. This accord established quantitative goals for developed countries to reduce emissions. The protocol also established specific mechanisms to enable industrial countries to achieve these reductions in a cost-effective way. The countries of Latin America took a leadership position in the negotiations related to climate change, and played an important role in the definition of the Clean Development Mechanism.

After the Kyoto event, the Bank, UNEP, and UNDP supported the creation of a Working Group on the Clean Development Mechanism to discuss climate change in the region. The first meeting of the working group took place during the Eleventh Meeting of Ministers of Environment of Latin America and the Caribbean (the Forum of Ministers, see the Environmental Management section below). The purpose of this meeting was to prepare for the negotiations in the context of the Fourth Conference of the Parties to the Climate Change Convention that took place in Buenos Aires in November where progress was made on the rules and procedures of governance regarding climate change. There, the Declaration of the Inter-

American Development Bank outlined the strategy that is being prepared to support our borrowing member countries.

In September 1998, the Bank held a consultative forum on a regional approach to the Kyoto Challenge during which the role of the IDB was discussed and participants provided some direction for the Bank's climate change strategy. The following lines of action were identified: capacity building and technical assistance in the area of climate change; the continuation of the program Sustainable Markets for Sustainable Energy; and support for the borrowing countries' needs for financial and technical assistance for adopting integrated coastal zone and forest management programs. (For further details on this topic see Chapter I).

INFORMATION SYSTEMS: INFORMATICS 2000 INITIATIVE

In September 1997 the Bank started the Informatics 2000 Initiative, a demonstration on the use of spatial information technologies in IDB Projects. At that time, SDS/ENV and Remote Sensing Facility gave demonstrations for visitors on Bank projects which had used imagery and spatial information tools including geographic information systems (GIS) and global positioning systems (GPS). Areas highlighted were soil conservation, land titling, risk analysis systems and national level information systems.

This year, more than 60 exhibits by over 50 companies and organizations from ten countries in the Western Hemisphere were on display from April 16-19 at Casa Piedra in Santiago, Chile, showing the latest advances and applications of information technology for the economic and social advancement of Latin America and the Caribbean. Titled *Information and Communications Technology, Strengthening the Hemisphere for the 21st Century*, the exhibit was organized by the Informatics 2000 Initiative of the Bank in conjunction with the Summit of the Americas. It was sponsored by the private sector and managed by Concerta, S.A. of Santiago.

Most exhibits showed new solutions that the region could start taking advantage of as soon as possible. Among the exhibitors were some of the largest global information high-tech companies, including Microsoft, Hewlett Packard, Sun Microsystems, IBM, Bellcore, Cisco Systems, TRW and Sybase. A number of regional companies, governmental and nongovernmental organizations, and international organizations also participated, including the World Bank, the Organization of American States, and the Pan American Health Organization.

The more than 2,000 special guests at the invitation-only exhibit included 15 ministers, vice ministers, and secretaries from eight countries: Barbados, Brazil, Canada, Chile, Costa Rica, Mexico, the United States and Venezuela. Many of these senior officials, as well as representatives of the public and private sectors and civil society, actively participated in roundtables and workshops held daily in the exhibit hall to examine information technology issues and solutions. Other participants included high-level officials from the IDB, PAHO, the Comisión Interamericana de Telecomunicaciones; the Organization of American States and the International Telecommunications Union; heads of five civil society organizations and several NGOs, including some small business organizations.

The exhibition met its objective of clearly showing that appropriate and affordable information and communications technology solutions currently exist that can improve economic and social efficiency and quality, allowing countries to compete successfully in the Information Age. Of particular importance is the ability of many of these technologies to provide substantially better services to the poor and rural populations.

FORUM OF MINISTERS OF ENVIRONMENT: THE REGIONAL DIALOGUE ON ENVIRONMENTAL PROBLEM AREAS

The Eleventh Meeting of Ministers of Environment of Latin America and the Caribbean (the Forum of Ministers) was held in Lima, Peru, from March 12-

13, 1998. The Forum is the principal intergovernmental body on environmental matters responsible for identifying and guiding environmental activities in Latin America and the Caribbean. Attending the meeting were representatives of 21 countries (ten were represented at the ministerial level). Observers, included representatives of international, regional and subregional organizations such as the UNEP, UNDP, the World Bank, FAO, ECLAC, the OAS and the IDB. NGO representatives were also present.

The forum adopted a regional action plan that established four priority topics for the next four years. The first topic, an institutional framework, policies and instruments for environmental management (see Chapter I), will include environmental education, citizen participation, promotion of the environmental dimensions of public policies, trade and environment, financing mechanisms, innovative economic instruments, and the exchange of experiences in the decentralization of environmental management. The second priority will be integrated watershed management. This area includes the environmental management of coastal and ocean zones and water resources management. The third area is the biological diversity and protected areas. The fourth is climate change, with an objective of establishing a consensus on regional positions.

In each of these areas the forum adopted tentative lines of action ranging from increased exchange of experience to concrete technical cooperation proposals. The Forum's recently established Inter-Agency Technical Committee (composed of UNEP, UNDP, and the IDB and open to other interested agencies) was asked to report on the development of the lines of actions, including funding sources, duration of implementation periods and expected outputs.

All delegations and agencies represented supported strengthening the Forum to maintain a structured dialogue on the common environmental problems in the region. With the adoption of its regional action plan focusing on a select group of priority actions, the Forum has provided the opportunity to make more progress with the lines of actions and the implementation of its decisions.

AGRICULTURE

The U.S. Department of Agriculture (USDA) and the Sustainable Development Department of the Inter-American Development Bank have strengthened collaboration through the temporary posting of a USDA Foreign Agricultural Service employee to the SDS Environment Division. In 1998, through a series of seminars, this strategic alliance strengthened the technical links between USDA agencies and Bank units in charge of environment, agriculture, rural development, and natural resource management.⁷ The objectives were to increase knowledge on the part of USDA and the IDB of the work each other does, and to explore areas of mutual interest with the hope that the two institutions could find areas to pool resources, thus multiplying their effectiveness.

IDB participants included specialists from SDS and the Regional Departments. USDA participants included program managers or thematic specialists from participating agencies, as well as staff from FAS International Cooperation and Development (ICD), the office which coordinates liaison between outside agencies and most of USDA. Staff interest in pursuing closer contacts was high at both institutions. A number of areas for possible cooperation were identified, among them sanitary and phytosanitary measures and food safety initiatives;

sharing economic and statistical information (especially trade and tariff databases); professional training in economics and extension; developing environmental strategies; promoting the privatization of markets; developing export market capabilities; developing methods for competitive research funding; and investigating the privatization of extension services.

IDB and FAO Strengthen Cooperation Ties

Collaboration between the Bank and the Food and Agriculture Organization of the United Nations (FAO) has been improving since 1993, when both institutions entered into an agreement establishing a framework for cooperation. The successful implementation of a joint technical workshop early this year was followed by the signing of a Memorandum of Understanding on June 26, 1998, which provided for the posting of an FAO Investment Center professional at IDB headquarters. The FAO professional joined the Environmental Division on September 1. The specific objective of his assignment is to link FAO's Investment Center, technical divisions and the Regional Office in Santiago, Chile, with the Bank's technical units in the areas of agriculture, rural development and natural resource management. In addition, this individual will assist in the identification and preparation of projects and in the formulation of sectoral and thematic guideline documents at a regional level.

To date, FAO participation in specific Bank operations includes the preparation of the water management component of Trinidad and Tobago's Agricultural Sector Investment Program, and in the design of land market interventions in Ecuador and Costa Rica. Likely areas of enhanced cooperation include: assistance in the formulation of the Bank's rural finance strategy; support to ongoing efforts by the Bank's Office of Evaluation to draw lessons from experience of past interventions in rural and agricultural development, identifying best practices and ways of enhancing project impact on rural poverty alleviation; and identification and continued support for specific operations of the Bank's Regional Operations Departments and SDS's Microenterprise

⁷ The series consisted of six meetings between USDA and IDB personnel revolving around specific themes of mutual interest. Those themes and participating agencies were:

1. Animal and Plant Health: Animal and Plant Health Inspection Service
2. Economics and Statistics: Economic Research Service. Foreign Agricultural Service. National Agricultural Statistics Service. World Agricultural Outlook Board.
3. Natural Resources and Conservation: Forest Service. Natural Resources Conservation Service.
4. Rural Development: Cooperative State Research, Education and Extension Service (CSREES). Rural Business-Cooperative Service. Rural Utilities Service.
5. Agricultural Marketing: Agricultural Marketing Service.
6. Research and Extension: Agricultural Research Service. CSREES

Unit.

Regional Fund for Agricultural Technology (FONTAGRO): Potential Cooperation with U.S. Research Organizations

FONTAGRO was created in 1998 and placed under the Inter-American Development Bank's administrative umbrella. The Fund was designed to finance transnational public goods and to generate research with resources contributed to an endowment mechanism by member countries/beneficiaries which also manage its competitive grant-making processes.

FONTAGRO has developed an increasing presence in the Latin American agricultural research community and is becoming more widely known among federal government agencies, educational institutions, academics, foundations, professional associations, and major multilateral organizations. The Fund foresees the establishment of successful partnerships with public and private institutions in the U.S. that will benefit from on-going research through more intense collaboration with the countries of Latin American.

Most countries in the region have pledged contributions to the Fund, which is expected to be consolidated (with a target endowment of \$200 million) during the next three years. In the meantime, the IDB is co-financing a limited number of projects with regional technical cooperation funds.

Musa Research and Technology Transfer Network.

Sixteen international agricultural research centers make up the global network known as the CGIAR (Consultative Group on International Agricultural Research). One of them, the International Plant Genetic Resources Institute (IPGRI), with headquarters in Rome, Italy, promotes the conservation and use of plant genetic resources, undertaking research, training and the provision of scientific and technical advice and information. IPGRI is currently working on the *Musa Research and Technology Transfer Network*, funded by an IDB regional technical

cooperation.

Bananas and plantains (known collectively by their generic name *Musa*) are of great socioeconomic and nutritional significance for about 185 million people in Latin America and the Caribbean. Most *musa* growers are small and middle-scale subsistence farmers who exploit the quasi-perennial nature of these crops to grow beans, peanuts and coffee in association with them. The project is developing disease-resistant banana and plantain varieties and promoting collaborative *musa* research in the region. At the national level, training is being provided to enhance the capabilities of national research systems in evaluating natural and improved germ plasm for its resistance to diseases and conformity to the standards of local markets.

IDB-IICA-IFPRI

Eight documents were published in 1998 as a result of an IDB-funded regional technical cooperation project on priorities for agricultural research in Latin America and the Caribbean executed by the Inter-American Institute for Cooperation in Agriculture (IICA) and the International Food Policy Research Institute (IFPRI):

1. *Prioridades de investigación agropecuaria en América Latina y el Caribe: Cinco años de experiencia conjunta IICA-BID*
2. *DREAM: Manual para el usuario*
3. *Impacto de la investigación de arroz en Latinoamérica y el Caribe durante las tres últimas décadas*
4. *Una revisión del software de evaluación de la investigación agropecuaria*
5. *Evaluación económica-ecológica de temas de investigación agropecuaria en países andinos*
6. *Analysis of Agricultural Research Priorities in the Caribbean*
7. *Evaluación económica ecológica de temas de investigación agropecuaria en Mesoamérica*
8. *Caracterización de cadenas agroalimentarias para evaluar investigación en el Cono Sur.*

The main objective of the project was to develop the analytical capacity to utilize quantitative methods to identify priorities for agricultural research at the national and subregional levels. Several databases with agroecological, socioeconomic and technical information were developed, as well as new methodologies and software to evaluate research impacts, and training of national research staff.

IFPRI and IICA also worked with Institutos Nacionales de Investigación Agropecuaria (INIAs) in four subregional forums to jointly undertake studies on the economic evaluation of agricultural R&D. The studies (reported in documents 5, 6, and 7 above) made quantitative assessments of the benefits of establishing national research priorities of common interest in a subregional context. One objective was to demonstrate and refine the agroecologically-based economic evaluation methods. However, the overriding goal was to develop the local analytical capacity to apply these policy evaluation methods. Given this objective, the studies were limited in scope and did not attach a high priority to fully resolving many data issues.

As a consequence of this effort, it was apparent that the agricultural R&D agenda, and associated institutional structures, vary significantly throughout the region but are all facing substantial pressures to reform in light of broader economic and policy changes. IFPRI is leading a significant follow-on phase of research designed to provide new information and assess the implications of alternative investment options that inform strategic R&D policy decisions. This research is being synthesized into an integrated series of policy papers. Topics include: a review of contemporary developments in commodity policies (that directly affect the public incentives to invest in agricultural R&D); a quantitative review of agricultural productivity, production, and returns to research, including an assessment of post-farm aspects; and a comprehensive economic assessment of regional priorities for agriculture in the region.

There are two unique aspects to this work. The policy simulation and assessment component is being complemented by a detailed survey of agricultural

R&D investment and institutional trends throughout the region for the past several decades. The survey includes developments in public and private research, with an emphasis on financing. A series of national R&D policy and institutional profiles is being prepared.

The other unique aspect of this study is the integration of GIS data and analytical techniques into the economic evaluation framework. The objective is to quantify the economic consequences of agricultural R&D at spatial scales that are relevant for many policymakers, while preserving the ability to represent the agroecological specificity of most agricultural technologies. This approach allows one to track the local and spillover consequences of new agricultural technologies. Production statistics are vital in identifying the spatial pattern of R&D benefits, and the project is compiling what should be the most comprehensive time series of sub-national production data for Latin America and the Caribbean yet produced. A report detailing the development and application of these new spatial policy modeling methods is also being prepared by IFPRI.

A second major effort funded by an IDB technical cooperation grant involved the completion of in-depth research on *Policies for the Control of Natural Resource Degradation in Amazonian Forest Margins* which was undertaken by the International Food Policy Research Institute.⁸

In Brazil, roughly 7,500 square miles of tropical rainforest were cut down and burned between 1995 and 1997. These forests were of obvious commercial value and the land they stood on has agricultural value. But, the lost forests also had important social value for the carbon and other greenhouse gases they sequestered and the biodiversity contained in them. The forest uses implied by private values are at odds with uses reflecting social values.

⁸ For more information, refer to the IFPRI website at <http://www.ifpri.org> or contact the principal investigator, Stephen Vosti by e-mail at S.Vosti@cgiar.org.

Small-scale farmers were responsible for the most recent wave of forest clearing – a process that cannot be halted by legal prohibitions alone. Three key questions emerge. How much do small-scale farmers benefit from deforestation, and do these private benefits outweigh social costs? Are the post-deforestation land uses sustainable in the sense that they can continue to produce profits while leaving some forest intact on the farm, and if not, can they be made to be? Finally, in addition to outright prohibitions, what policies might be effective in slowing deforestation by smallholders and making subsequent land use more sustainable?

The research team reached the following conclusions:

- *Sustainability of Small-Scale Agriculture.* Deforestation will persist under current economic, technological, and policy conditions because the per-hectare nutrient value of the forest over time to farmers is higher than the one-time cost of conversion, no purchased substitute for nutrients is affordable, and the forest holds little else of value for the farmer. However, even in the absence of deforestation restrictions, land use patterns will stabilize without completely destroying the primary and secondary forests on small farms, but the remaining forest reserves will be far below the amount mandated by current federal law.
- *Environmental Costs and Private Benefits.* The environmental costs of deforestation are large in terms of carbon emissions and biodiversity, but cleared land can be managed in ways that reduce these costs. Because the private benefits of deforestation can be quite large, persuading farmers to deforest less will not be easy, nor, in the aggregate, cheap. Still, based on some figures currently in use for the worth of sequestered carbon alone, the social gains from saving forests outweigh the private profit forgone by not deforesting, but mechanisms for realizing transfers are limited.
- *Technology Generation: Two Targets, Aim for Both.* Technological change can promote forest conversion by affecting the desired size of cleared area and/or the rate at which forest is removed to achieve this objective. Investing in the generation of technologies or products that target already cleared areas for intensive use and supplemental measures to make forest conversion more costly for farmers is an appropriate strategy for improving growth, incomes and environmental outcomes. Failing to modernize agricultural technologies will drastically reduce smallholders' incomes, and probably not save the forest in the longer term.
- *Emerging Production Systems.* Smallholder cattle production systems are on the rise in the study area because they can fulfill multiple objectives (profitability, liquidity, food security, risk avoidance); most agroforestry schemes currently available, although profitable and more environmentally benign, cannot match the versatility of these livestock systems.
- *Poverty in Colonization Projects.* Poverty is not a major issue in the colonization projects studied. Some farmers are gravely poor, particularly in the early stages of settlement of forested lands, but farmers being settled now have more options than their counterparts did two decades ago.
- *Adding Value to Forests.* Adding value to forests held by small-scale farmers will be fundamental to saving them; allowing sustainable managed forestry and promoting non-timber tree products (NTTP) are ways of doing so. Government should assist in identifying and establishing self-financing institutional mechanisms to ensure that logging and other extraction is done sustainably and that NTTP markets function well.
- *Local Organizations.* Local organizations are increasingly called upon to fill gaps in services previously provided by government, but their potential for doing so effectively and efficiently

is not known. Moreover, membership in local organizations is expensive, both in terms of time and of out-of-pocket expenses. In all cases, action by government at some level is essential to providing rural services to smallholders.

- *Rural Marketing Systems.* Regional integration is causing fundamental changes in market structure and marketing systems in the frontier study region. Farms will have to change management practices to meet new and more specific product criteria. The availability of local actors able to fill new and increasingly specialized marketing roles is unknown; relying on the private sector to take on all roles is unwise.
- *A Lasting Role for Smallholders Already in the Amazon Basin.* The number of smallholders in the region is expected to fall, and those that remain may have to expand their holdings to stay competitive. A wholesale replacement of smallholders by large farm enterprises may contribute significantly to agricultural GNP, but could also have serious environmental and poverty consequences.
- *A Potential Wave of New Migrants.* Small scale agriculture in the region can be profitable, so the financial incentives for migrating to the western Brazilian Amazon still exist. The result of renewed migration could not only mean an influx into protected areas, but increased incentives and capability to take down forests in already settled areas.

DESERTIFICATION

Four regional conferences took place following the ratification of the Convention to Combat Desertification (1996) which promotes the creation and implementation of national, regional and sub-regional action programs,. They were held in Buenos Aires, in January 1996; Mexico City, in June 1996; Havana in March 1997; and Antigua in 1998.

The participation of representatives of twenty-eight countries of the region plus an important number of

representatives of global, regional and bilateral organizations in the Antigua conference held this year suggests the magnitude of the problem. National Action Plans in the most affected countries, Argentina, Brazil, Bolivia, Chile, Mexico and Peru have advanced considerably, followed by similar efforts in El Salvador, Guatemala, Honduras, Nicaragua and Dominican Republic. An IDB representative participated in the First Central American Encounter to Fight Desertification and Drought. The workshop provided methodology to be followed by participating countries in the preparation of their national action programs in specific areas such as community participation, strategic alliances, NGO participation, gender, and technical and financial resources.

In Mexico, a National Forum on Desertification and Poverty took place June 17 to 19, 1998. The 19th of June was declared *International Day to Fight Desertification*. The purpose of the forum was to analyze and disseminate information about the problem of desertification and poverty in the dry lands of Mexico, an area that encompasses 14 states and a population of 30 million.

The First Conference of the Parties at a global scale was held in Rome in 1997. Bonn was elected as the permanent headquarters of the Executive Secretary of the Convention. The International Fund for Agricultural Development was elected as the headquarters of the Global Mechanism for the Convention Financing. The Second Conference of the Parts was held this year Dakar, Senegal between November 30 and December 11.

ENVIRONMENTAL IMPACT ASSESSMENT

XXVI International Congress on Sanitary Engineering and Environmental Sciences: Environmental Management in the XXI Century

The Environmental Management in the XXI Century Congress organized by the Inter-American Association of Sanitary Engineering and Environmental Sciences took place from November 1 to 5 in Lima, Peru. This association, founded in 1948,

organizes a regional meeting every two years to reflect, evaluate and exchange experiences in sanitary engineering and the environment. The objectives of the 1998 Congress were to analyze new regional problems in environmental management and work together toward possible solutions to be applied through government policies. The Congress also provided an opportunity for the dissemination of specialized knowledge on sanitary engineering and environmental sciences, and the promotion of trade between enterprises related to the sector.

Before the plenaries, SDS/ENV representatives gave a seminar on Environmental Impact Assessment in Investment Projects to approximately 70 specialists. The course presented assessment as a fundamental preventive tool for environmental management. The Bank uses the process systematically throughout the project cycle to incorporate impact assessment in the development of policies, plans, and sustainable programs.

During a plenary session of the Congress, nearly 800 people participated in a second seminar on Environmental Impact Assessment in Sanitary Engineering. IDB specialists presented different case studies from sanitary engineering to demonstrate positive and negative project impacts on the social and natural environment. The studies focused on the growing construction of wastewater treatment plants in Latin America, and the Environmental Impact Assessment Process was discussed in detail. A document about EIA extracted from the United Nations Environmental Programme and translated into Spanish by CATIE (Centro Agronómico Tropical de Investigación y Enseñanza) was distributed to participants.

Environment and the Privatization of Public Services

The Sustainable Development Department organized a workshop on *Environmental Evaluation of the Privatization of Public Services in Latin America* in April. The objective of the seminar was to discuss the results of a study to assess environmental evaluation practices and the social impact of privatization

in Argentina, Bolivia, Chile, Mexico, Panama and Peru. The study was undertaken through field visits, interviews with practitioners, managers, consultants, multinational organizations officials and decision makers, review of pertinent documentation, and analysis of pre-privatization conditions, privatization schemes, and environment concerns. The study generated conclusions that included some broad environmental guidelines for the privatization of public services. Publication plans have not yet been announced.

ENVIRONMENTAL ECONOMICS

Two environmental economists from the IDB (see Chapter V) participated in a workshop on Alternatives to Traditional Contingent Valuation Methods held in October at Vanderbilt University in Nashville, Tennessee. The workshop, sponsored by the National Science Foundation, brought academic economists, psychologists, decision analysts and representatives from government and international agencies together to discuss the relative merits of monetary and nonmonetary methods for eliciting values and preferences for environmental goods.

The psychologists questioned the existence of stable, consistent individual preferences (which economists take for granted) and the ability of survey methods to represent them reliably, should they exist. The decision analysts proposed multi-attribute voting and stakeholder participation methods as an alternative to cost-benefit analysis as a way of determining interests, defining objectives, and evaluating tradeoffs among those objectives. A number of interesting papers were delivered by the economists in the group, especially on the use of different contingent valuation and contingent choice approaches to develop monetary measures of willingness-to-pay for multi-attribute environmental improvements. The agency representatives shared their experiences in bringing stated preference valuation methods to bear to help inform the process of making important policy and investment decisions, and expressed some frustration with the cost of developing benefits numbers and the reluctance of the users of those numbers to understand or accept

the uncertainty range inherent in them.

The conference *Beyond Growth: Policies and Institutions for Sustainability*. Fifth Biennial Meeting International Society for Ecological Economics sponsored in part by the IDB and organized by the Sustainable Development Program Public Policy Analysis Center University of Chile and the International Society for Ecological Economics. The sessions took place in mid-November. They explored the contributions that are being made by the emerging discipline of Ecological Economics in the search for a style of economic growth that allows for the sustainability of natural resources and the environment, the achievement of a better quality of life, the reduction of poverty and the alleviation of social injustice at national and international level. This requires the articulation of different scientific perspectives, not only for a better understanding of environmental, social, cultural, and economic problems, but also to identify solutions aimed at designing effective policies and institutions. Bank representatives presented papers on land use in the Amazon and financial volatility in Latin America.

OTHER ACTIVITIES

Bank Business Briefings

The Bank offered a business seminar on April 3, on its procedures and procurement policies, as well as high tech business opportunities that result from the multibillion dollar IDB lending program for Latin America and the Caribbean. The forum was intended primarily to brief consultants and suppliers interested in contract opportunities available in the field of information technology. The seminar provided information on the use of information technology in several fields including the environment.

On May 5 there was a forum of environmental business opportunities in Latin America and the Caribbean intended primarily to brief consultants, suppliers and works contractors interested in contract opportunities available in fields relating to the environment and natural resources. Topics covered at the seminar included environmental impact assessments and project quality control; potable water and pollution management programs; environmental equity funds; environmental institutional development and management strategies; watershed management programs; meteorology programs and relief from El Niño; and clean energy programs

Environmental Film Festival

As part of the 1998 Environmental Film Festival in the Nation's Capital, the Bank, showed two films, *Secrets of the Choco* on March 30 and *Expedition Panama* on April 2. Both films were followed by a panel discussion on IDB initiatives related to natural preservation.

The documentary *Secrets of the Choco* is about one of the largest relatively unspoiled rainforests on the planet, which harbors thousands of undiscovered plants and animals. Large scale development plans threaten the future of Colombia's Choco and the lives of the black and Indian peoples who live along the banks of its maze of rivers.

In *Expedition Panama* Alan Alda visits scientists working at the Smithsonian Tropical Research Institute, a living laboratory of incredible biodiversity on an island in the Panama Canal. In five segments, this video discusses the ultrasonic communication of bats, a rodent that could be a key to saving Panama's rain forest, the communication of stingless bees, leafcutter ants and their relationship to fungus gardens, and how the land bridge formed by the isthmus of Panama changed the world millions of years ago.

V. Publications

OF SPECIAL INTEREST

When Latin America began its historic opening to the world economy in the 1980s and 1990s, most observers and participants in the process probably thought of the region as a capital scarce, labor abundant economic area, and thought that the economic effects of the opening would be conditioned by these circumstances. For example, as simple trade theory tells us, the region's trade liberalization could be expected to raise demand for the relatively abundant factor of production, and if this factor is labor, we might have expected to see major expansions in the production and exports of labor-intensive products. Such a development would be welcome not only on efficiency grounds, but also on distributional grounds, as the consequent upward pressure on demand for unskilled workers' wages would be expected to improve the distribution of income.

However, during the 1990s it became clear that this view of the region is incomplete and, in an important sense very misleading. Compared to industrial economies, Latin America does suffer from a scarcity of capital and enjoys an abundance of unskilled workers, but in the global economy of the 1990s Latin America is far from the most labor abundant and capital poor region, that honor belongs to the economies of emerging East Asia. Latin America is special because of its enormous endowment of natural resources. And the impact of this endowment was clearly felt in many countries of the region, as economic liberalization was followed by rapid growth of foreign investment and exports of natural-resource intensive products, with a much more modest growth of labor-intensive manufacturing industries.

Also during the 1990s, the economics profession was gaining a new appreciation for the impact of geography and natural resource endowments on patterns of economic development, spurred in large part by the

influential paper by Sachs and Warner which found that resource-poor economies often vastly outperform resource rich economies in economic growth, even after accounting for other determinants of economic growth. These were not, of course, the first authors to point out this inverse relationship between resource wealth and economic growth; arguably the most astonishing economic development of the past 30 years has been the extremely rapid growth of the resource-poor "Asian Miracle Economies," whose performance was frequently juxtaposed against slow-growing oil economies like Mexico, Nigeria, and Venezuela. The monumental waste and costs associated with mismanaged natural resource booms were already well known. But Sachs and Warner's work was important because it was the first comprehensive and methodical assessment of the association between resource abundance and growth, and showed that, even after controlling for other determinants of economic growth, the quantitative significance of the relationship was very large. For example, their estimates imply that a 15 percentage point increase in the ratio of natural resource exports to GDP reduces predicted growth by over a percentage point per year.

More recently, Gallup and Sachs have extended this line of research to include other dimensions of a country's natural resource endowment, including in particular aspects of its geographical inheritance. They provide convincing evidence that tropical countries grow substantially more slowly than do countries in subtropical and temperate climates, that landlocked countries grow slower than do countries where most of the population is along a coastline, and that the distance of a country from major centers of economic activity hurts economic development.

This raises important questions about recent Latin American experience. What does increased reliance upon natural resource-based industries mean for development prospects and for the distribution of

income? Has trade liberalization promoted increased reliance upon exports of natural resources and had adverse consequences for economic growth, income distribution, and economic instability?

Nature, Development and Distribution in Latin America Evidence on the Role of Geography, Climate and Natural Resources by Ricardo Hausmann and Michael Gavin (Office of the Chief Economist, WP-378, August 1998) attempts to answer these questions.⁹ Their statistical analysis shows that countries near the Equator with rich land and natural resource endowments tend to grow more slowly and have more inequality than countries in temperate latitudes that are less richly endowed. Speculations about the mechanisms that might cause abundant natural resources to have negative economic and income distributional consequences include the adverse effect that tropical conditions have on labor productivity and wages, the large capital requirements needed for natural resource development, and the exposure to increased macroeconomic volatility caused by reliance on natural resource based exports.

Latin America has one of the largest and most diverse remaining forest areas on earth. This valuable resource is rapidly being destroyed, which contributes to persistently high levels of poverty and creates environmental problems. One of the principal objectives of the new book *Forest Resource Policy in Latin America* (Kari Keipi, ed.) is to provide ideas and provoke discussion on how to change policies and stimulate more effective management and investments in Latin American forests.

Close scrutiny of the causes of deforestation and forest degradation in the region appears to point to policy and institutional failures as the main culprits. The book assesses the economic and social impacts of alternative macroeconomic and sectoral policies on forests, and reviews the most effective financing

and policy mechanisms for sustainable use and management, including incentives for forest investment. It tackles the thorny social issues of property rights, deforestation, and forest ownership and management by indigenous peoples. Alternatives for habitat protection and rural income generation are outlined, and forest concession policies and trade policies affecting the region are analyzed. The chapters employ an array of case studies to illustrate and explain past successes and failures, in an effort to improve future chances for success.

Accepting the central premise that forests have value, a balance can be struck between their preservation and their contribution to short-term development. A series of ways to improve national and international policies is suggested, and promotion of a range of forest uses with public participation is recommended. Work is needed in establishing innovative financing mechanisms, both for investments in the production of marketable products and in the provision of environmental services at the country and global levels.

Latin America loses about 9 trillion cubic meters of water each year, about 33 percent of the water collected and treated for public consumption. While it is impossible for water systems to deliver 100 percent of their water to the household tap, Latin America could cut those losses by more than three-quarters if they could reach international standards for properly managed and operated water systems. The new book *Spilled Water: Institutional Commitment in the Provision of Water Services* (William D. Savedoff and Pablo T. Spiller, eds.) asks “If the costs to society are so great in terms of tax revenues, environmental impacts, and reduced coverage, why does it appear to be so difficult to properly manage and operate water systems in the region, and more generally in the developing world?”

The book shows that the problem is not related to project finance issues or lack of technical or manpower capabilities, but rather to the political economy of the sector. Its message is that the nature of the sector, coupled with the nations’ political institutions create incentives for governments to behave

⁹ This paper can be read or downloaded from the IDB’s Office of the Chief Economist web page at: <http://www.iadb.org/occe/324a.cfm?CODE=WP-378>

opportunistically, for water companies to operate inefficiently, and for the public to withhold support from the sector. Thus, the water sector, as with other utilities in the region, has a tendency toward a low-level equilibrium from which it is difficult to escape. The problems of regulating the water sector are not uniquely related to the recent efforts to involve the private sector through concessions, but rather are an essential part of why public enterprises in the region, and the developing world in general, have had difficulties providing efficient services.

PUBLICATIONS OF OTHER ENTITIES UNDERTAKEN WITH IDB FINANCIAL SUPPORT

While municipal authorities recognize the need for green space in urban areas, there is almost no literature or information exchange on the topic in the region. To fill this gap, the volume *Areas verdes urbanas en Latinoamerica y el Caribe*¹⁰ edited by L. Krishnamurthy and IDB Senior Natural Resource Specialist J. R. Nascimento, contains the proceedings of an IDB-sponsored conference on Urban greening in Latin America and the Caribbean held in 1996. During three days of meetings, city mayors, environmental and urban green space managers, consultants, and representatives of nongovernmental organizations from 26 countries exchanged experiences and made recommendations, ultimately agreeing to establish a regional network on the management of green areas in the region.

Mexico's Autonomous University of Chapingo hosted the events and published the volume, which contains the eleven papers presented at the conference. The first section of the book contains six chapters that look at the state-of-the-art in identifying benefits and costs of urban greening, technical matters, planning, public participation, financial and economic issues, and the legal and institutional framework. The second major section presents case

studies on urban greening experiences in Brazil, Chile, Colombia and Mexico. Each case illustrates the themes treated in the first part of the book and draws lessons from the experience. The final part contains the results of four seminar events.

PAPERS BY IDB STAFF APPEARING IN JOURNALS OR PRESENTED AT PROFES- SIONAL MEETINGS

Ruben Echeverría, an IDB economist involved in the development of the Bank's strategies for rural poverty reduction and sustainable food and agriculture development, produced five papers on financing agricultural research and extension.

The first paper, "Notas sobre algunas experiencias del financiamiento de proyectos de extensión rural en América Latina y el Caribe" appeared in *Situación y Perspectivas del Complejo Transfe-rencia de Tecnología, Asistencia Técnica y Exten-sión Agropecuaria*, (Cuadernos Técnicos No. 3, IICA, San José, Costa Rica, June 1998). The document briefly reviews agricultural extension financing experiences in Latin America. The context is provided by recent declines in funding for such programs and the resurgence of rural extension issues, probably given the fact that rural poverty is not decreasing in the region. Echeverría highlights the importance of targeting extension programs for those producers with agricultural potential, and the complementarity with other instruments to reduce rural poverty, such as credit and access to land. It also focuses on the need to see extension programs jointly with research and education, and not in isolation as in the past. The note explains recent experiences on funding extension projects via national and municipal governments; most of such projects are financed with public funds and executed by nongovernmental organizations. It seems that, given past experiences, the trend is to link transfer of technology activities with agricultural research projects while extension efforts are more related with rural development projects. A regional in-depth study analyzing extension methods and impacts, and reviewing best practices for extension programs is suggested in the document.

¹⁰ Available only in Spanish. Purchase information can be obtained from the publisher, Universidad Autónoma Chapingo, Apartado 88, Chapingo, Mexico at Tel/fax (52)-(595)-40516 or via e-mail to krishna@mail.internet.com.mx.

Echeverría, along with co-authors E. J. Trigo, and D. Byerlee contributed the chapter “Financing Agricultural Research in Latin America to the book *Financing Agricultural Research: A Sourcebook*”, edited by S. R. Tabor, W. Janssen, and H. Bruneau that was published by ISNAR, The Hague, The Netherlands. The chapter reviews recent institutional changes and innovative mechanisms for financing agricultural research in Latin America, including commercialization of research results through joint public-private sector ventures, competitive funds, research foundations, farmer-managed levies on agricultural production, and greater involvement of universities and private agribusiness. All of these mechanisms are playing an increasing role in alleviating severe budget constraints on public sector research institutes, and to reverse the chronic underfunding of national agricultural research systems. However, the public sector is still the main source of financing for agricultural research in Latin America and the main executor of research activities.

It is imperative that public funding of agricultural research be increased to address new demands on the research system (e.g., for natural resource management), and to fill a growing gap in maintenance and investment in the physical and human capital infrastructure for research. The execution of research tasks could be done by several public and/or private elements of the national system. Reforms in the traditional national research institute model of agricultural research are needed to make it attractive for governments, farmers, and the private sector to invest in agricultural research.

“Agricultural Research Policy Issues in Latin America: An Overview” appeared in Vol. 26 of *World Development*. There, Echeverría reviews two critical challenges facing research organizations and governments in the region: obsolete institutional structures and lack of stable funding for agricultural and natural resource management research. The paper describes recent trends in research investments, financing alternatives, and the institutional evolution of research organizations in order to meet those challenges. A preliminary conclusion is that the current low level of financing for research, together

with the dramatic organizational changes taking place in several public research organizations in the region, provide an opportunity to develop truly national agricultural innovation systems.

In a similar vein, Echeverría, K. Fuglie, and C. Pray review funding trends for agricultural research in the United States and Latin America in *Science and Technology for Agricultural Development: New Institutions for Funding and Performance*, a paper presented at a conference held in Cartagena, Colombia on the new strategic role of the rural sector for Latin America’s development. The authors discuss the growing role of the private sector in international agricultural research and technology transfer, and describe some of the new institutional arrangements that have developed which strengthen public-private cooperation in financing and conducting agricultural research.

Fuglie, Echeverría and Pray argue that sustaining agricultural growth and rural development into the 21st Century will require a renewed commitment by national governments to strengthen the capacity to develop improved food and agricultural technology. However, the stagnation and instability of public funding of agricultural research has weakened national research systems in several countries in the Americas. While private sector investments in agricultural research and technology transfer have grown considerably over the past two decades, much agricultural research will remain the responsibility of the public sector, especially in high-spillover research where potential economic benefits to the sector are substantial.

The authors conclude that industrial nations will probably continue to supply most of the basic research in agricultural sciences for some decades to come, given their larger scientific and financial capacities. But the rapid rate at which agricultural technology flows across national boundaries points to the importance of strengthening multinational institutions for supporting fundamental and strategic agricultural research. Multinational cooperation can help overcome the “free-rider” problem that individual nations may face if they invest in this kind of

research. Multinational consortia such as the CGIAR system and FONTAGRO (see below) are examples of institutions that can produce high-spillover science and technology to the benefit of many nations.

Finally, in *Will Competitive Funding Improve the Performance of Agricultural Research?*, an ISNAR Discussion Paper,¹¹ Echeverría observes that competitive grants for research on agriculture and natural resources are being widely used in developing countries, especially in Latin America. Policymakers and donors see competitive funding mechanisms as effective tools to redirect priorities, lower research costs, and strengthen the participation of universities, foundations, and other non-public and private sector research entities. Research managers, in turn, see competitive grants as an additional source of resources, especially scarce operating funds, and as devices to develop joint ventures with other public and private sector research organizations. However, information is still lacking on the circumstances under which the use of competitive funding is most appropriate, its complementarity with more traditional institutional funding mechanisms, and benchmarks to measure its performance.

The paper begins to fill this gap by highlighting the potential advantages and disadvantages of competitive grant funding, and proposes some guidelines for improving its effectiveness. Competitive funding is only one of several ways to finance research; when it complements institutional funding it has the potential to increase research performance.

Future directions for forestry finance and policy are at issue in Kari Keipi's contributions to two international meetings: the Expert Consultation on Forestry Policy in the Caribbean (held in May in Trinidad and Tobago), and the First Latin American Conference of the International Union of Forest Research Organizations held in (Valdivia, Chile in November).

¹¹ A Spanish language version will be published as an IDB working paper in 1999. This paper is the result of ongoing collaboration between the International Service for National Agricultural Research (ISNAR) and the IDB.

The starting point in Keipi's *Directions for Forest Policy and Financing in Latin America and the Caribbean* is a desired goal—management of forests to simultaneously fuel economic development and preserve the region's natural heritage and biodiversity. This challenge has yet to be met successfully. Rather, differing perceptions of various stakeholders on the role of forests and conflicting priorities in conservation and development have created a swirl of controversy about ecologically acceptable strategies for the sustainable management and protection of forests.

Earlier forest policy paradigms stressing either industrial forestry and growth, social forestry and rural development, or preservation forestry and global/national ecological benefits have not worked in many cases. Each has been beset by top-down approaches, one factor logic, mythology and quick-fix schemes, forgetting that people and their living conditions must be the focus of land use.

On the financing side, transfers of funds from the industrial countries for forestry are well below target levels of commitment established through the UNCED process, and in fact, have been declining. The papers argue that the fate of the world's forests depends on the financial viability of alternative forms of forest resource use. Unless sustainable forest management and conservation are financially competitive with other uses, it will be difficult to prevent deforestation and forest conversion. While appropriate policy support from governments is needed, a diversity of economic activities will also play a key role in establishing the financial viability needed to secure the forest estate.

Greater attention is now being paid to the vast array of nontraditional forest products and ecological services such as ecotourism. Certification and eco-labeling of traditional products may provide additional value for sustainably managed forests. The idea of securing payment for the non-marketed environmental benefits (biodiversity, water, climate) provided by forests is one that offers developers and conservationists a less conflictive common ground and an opportunity to agree on worthwhile actions.

IDB economist Michael Collins presented two papers on land use in Brazil at the Fifth Biennial Meeting of the International Society for Ecological Economics. The conference, "Beyond Growth: Policies and Institutions for Sustainability," was held in November, in Santiago, Chile.

The growth of cattle ranching in the Amazon region, and the associated rise in planted pasture, has been correctly identified as one of the major direct causes of deforestation in the region. Many authors have linked a series of direct and indirect government policies during the 1970s and 1980s as encouraging this process. Collins' paper, *Land Use Change, Pasture Demand and Deforestation in the Eastern Amazon*, presents results from the analysis of surveys conducted in 1996 in the Municipality of Paragominas, State of Para, Brazil, an area characterized as old forest frontier.

The analysis of the dynamics of land use allocation in surveyed properties shows that while pasture expansion prior to the late 1980s came at the expense of forested land, the planting of new pasture on old, low productivity or abandoned pasture fields since the late 1980s has become the prevalent form of satisfying pasture demand by ranchers. Two interrelated factors help explain this shift in land use patterns. The availability of large areas of old pasture fields (largely planted in the 1970s and early 1980s) and the increasing scarcity of primary forest as a source of timber have contributed to a (private) economic environment in which pasture plantings on old fields is more cost effective than clearing forest.

Collins' second paper, *Environmental and Economic Impacts of Accidental Fires in the Eastern Amazon*, deals with the externalities arising from a common form of land clearing. The extent of deforestation in the Amazon region has had important environmental, economic and social impacts. While there are numerous studies dealing with these issues, little research exists on the impact of landscape change (from forests to one characterized by pasture and agricultural fields, secondary, logged, and virgin forest in old frontier areas) on the incidence of fire externalities. As a critical ingredient in the land

conversion process in the Amazon region, the use of fire is prevalent. As the extent of deforestation has increased, so has the probability of fires moving into areas not intended to be burned. This study analyzes the impacts of fire use in the Municipality of Paragominas, Para, Brazil, based on field surveys conducted in 1995. The paper deals with the occurrence, causes, and impacts of accidental fires. Over 50 percent of surveyed properties had experienced accidental fires. Pasture fields were both the most important source of fires, as well as the most affected land use. The paper also examines the link between forest cover and occurrence of accidental fires and compares the extent of forest clearing for agriculture and ranching with the area of forest damaged by fires.

IDB economist Steven Stone published three journal articles dealing with forestry and land use in the Amazon. A spatial and dynamic model of timber extraction was constructed and used to forecast industry growth in the Eastern Amazon over the next ten years in Stone's "Using a Geographic Information System for Applied Policy Analysis: the Case of Logging in the Eastern Amazon, *Ecological Economics*" Volume 27, Number 1. Once calibrated, the model was used to project future harvests and the stock of forest resources over time under different price increase and policy scenarios. The results suggest a limited role for the state in influencing the pace of industry growth, but a larger role in determining where extraction might occur. In particular, the state can exercise substantial influence over the spread of logging through the designation of indigenous, military, and nature reserves as protected areas, and through the decision of where to build and pave roads. Imposing new regulations, by contrast, may have unintended consequences such as constraining intensive extraction while promoting selective extraction in areas that are more difficult to enforce.

Stone's review of "Economic Trends in the Timber Industry of Amazonia: Evidence from Para State, 1990-1995" appeared in *The Journal of Developing Areas*, Volume 32, Number 1. Building on earlier efforts to characterize the timber industry in the

Eastern Amazon, this research attempts to identify the principal economic trends by analyzing extraction, transportation, and processing data collected by the author in 1995. Interviews focused on milling areas in the Amazon delta, in an old upland frontier, and in a new upland frontier all of which had previously been surveyed by researchers from IMAZON in 1990. Using these studies as a point of reference, the 1995 survey examines changes in levels of investment in machinery, use of labor, and unit costs of production over time in each of these areas. The results provide an overview of frontier dynamics that, even over the short period of five years, may suggest how the industry will evolve as it grows and moves across the basin.

The timber industry of the Brazilian Amazon is changing rapidly. From a slowly evolving base of extraction in the estuary areas, the industry has expanded along an extensive road network penetrating upland forests. Stone examines changes in the economic profile of timber extraction and processing in an old frontier area in “Evolution of the Timber Industry Along an Aging Frontier: The Case of Paragominas”, *World Development*, Volume 26, Number 3. As one of the earliest centers of upland logging in the Amazon, its experience after twenty-five years offers insights as the industry spreads to other regions in the basin. This paper presents a theoretical model of industry evolution in frontier areas, and analyzes response to local shortages in raw materials, rising international wood prices and increasingly stable property rights as the frontier matures.

In October, Bank staff presented three papers at a technical meeting organized by the Organization of American States entitled “Sustainable Development in Latin America and the Caribbean: Policies, Programs and Financing”.

The interest in reducing water pollution problems in Latin America has been increasing steadily during the last decades. Most countries now have central environmental authorities that recognize this as one of their main jobs. Solving the problem nevertheless has proven to be more difficult than initially antici-

pated. In *Lessons from Water Pollution Control Efforts in Colombia, Ecuador and Venezuela* economist Sergio Ardila explores water pollution control efforts in three Andean countries and derives some lessons on how best to approach the difficult problem of financing solutions to potable water and sewer service provision, and ambient water quality improvement.

Based on a combination of economic theory and observed experience, the author reviews issues associated with the control of municipal, industrial and non-point pollution sources, the phenomenon of a relatively slow introduction of economic instruments, the earmarking of financial resources generated by charge-based systems, and subsidies for public water utilities. On the latter, for example, he believes the situation of public water utilities in these Andean countries suggests that they will not be in a position to implement tariff adjustments to cover potable water and sewerage costs, and even less to cover sewerage treatment costs, unless they introduce more efficient management. In this sense, the road to promote user charges for financing municipal sewage treatment passes through the improvement of the managerial, financial, and technical situation of these public utilities.

The best way to design environmental enforcement activities in order to achieve cost-effective environmental compliance is a complex and widely debated issue. Much depends on the adequacy of the environmental laws and regulations themselves, but also on the costs related to enforcement activities, such as monitoring, and the availability of instruments and the capacity of institutions, including the judiciary. In his technical report *Environmental Enforcement in Latin America and the Caribbean* prepared for the OAS workshop, IDB attorney Gil Nolet describes some recent developments in environmental enforcement in Latin America and the Caribbean. The paper briefly analyzes the common problems related to achieving compliance, and reviews enforcement’s potential contribution to revenue generation. The paper also describes alternative approaches to traditional public environmental enforcement, such as private enforcement and voluntary compliance

programs, and includes some recent high profile environmental court cases.

In a third paper for the OAS, IDB forester Kari Keipi discusses *Financing Biodiversity Conservation in Latin America*. Biodiversity is mostly considered a public good which provides global, national, and local benefits but for which it is difficult to mobilize financing. Adequate financing for the conservation and sustainable use of biodiversity remains a very challenging endeavor. At the heart of this challenge lies the reality of biodiversity's low perceived financial and political value, which is linked to nonexistent or ill-defined property rights; insufficient knowledge about biodiversity and how to measure its socioeconomic value; the perception that the protection of biodiversity does not directly affect the daily lives of urban populations (as does sanitation, air pollution control, etc.); multiple institutional and enforcement failures; and finally, often perverse or conflicting incentives to conserve and protect biodiversity. The paper reviews alternative sources of biodiversity funding, including financing through government budgets; community and private sector financing; grants through the GEF, bilateral donors or the international NGOs; development loans by multilateral entities; and revenue collected from payments for environmental services such as water, forest products, ecotourism, and mitigation of global climate change.

The IDB was represented by two papers presented at the World Congress of Environmental Economics held in Venice, Italy in June.

Clifford S. Russell, Philip T. Powell (Vanderbilt University) and William J. Vaughan (IDB) make four main points in *Rethinking Advice on Environmental Policy Instrument Choice in Developing Countries*. They argue that the several widely touted advantages of economic instruments for environmental policy implementation (see Ardila above) each come at a cost. That cost often, if not always, takes the form of added stress on the institution responsible for setting up and operating the instrument scheme. For instance, realization of the potential static economic efficiency gains promised by effluent

charges requires administrative overheads because the agency must calculate the optimal efficient charge schedule which differs by source. To do this, mathematical models are required and the agency must acquire large amounts of information on source cost functions, damage functions, and the behavior of the ambient environment, to construct regional models embodying that information, and solve them for the set of emitter-specific charges that produce the desired ambient quality at the lowest cost. Because the responsible institutions in developing countries may initially find these costs hard to bear, the authors suggest that it makes sense to start with institutionally less demanding instruments and work toward the more sophisticated approaches as institutions learn and mature and technical skills accumulate.

Sergio Ardila analyzed a completely unrelated topic for the Venice meeting in *Defining the Minimum Number of Agents as an Alternative to Regulate the Gas Market in Colombia*. Colombia has important reserves of natural gas and is beginning to develop national infrastructure to supply various regional markets interconnecting them with various gas fields. A few international companies and the national oil company have rights to extract the resource from different gas fields located throughout the country and sell it to regional distribution companies. The combination of two main factors, transportation costs and the existence of very few players, indicates the possibility that the extraction of monopolistic rents plays an important role in the functioning of this market. While in the past this circumstance called for handling the problem through a not-for-profit public company, motive, different solutions can be proposed today, including regulating markets.

The spatial price equilibrium model has been used to analyze markets characterized by movement of goods with competition among firms. This model has an important limitation: it assumes that markets are competitive. This paper presents a series of models to analyze the welfare implications of different market structures for the supply of natural gas in Colombia. Using preliminary information about gas reserves, transportation costs in the national gas line

and demand functions, several models are solved to determine the social welfare that could be achieved by a social planner, a single monopolistic company and different numbers of companies that behave in a way consistent with a Cournot-Nash equilibrium.

The paper shows that a relatively small number of players (gas extracting companies selling the resource to regulated regional distribution companies) can achieve a level of social welfare close to what would be achieved by a central planner, with the additional advantage of avoiding the well-known pitfalls of governmental monopolies or cumbersome regulatory rules.

The National Science Foundation sponsored a workshop at Vanderbilt University in October that brought research economists, decision analysts and environmental and resource agency representatives together to exchange views on alternatives to “traditional” contingent valuation techniques. The elicitation of the values that individuals attach to various environmental improvements can be undertaken using either revealed or stated preference methods, the difference being that revealed methods use actual data observed in functioning markets while stated preference methods employ constructed markets in an experimental setting to elicit peoples’ preferences. The most widely used stated preference method is contingent valuation (CV), which tries to get at willingness-to-pay in money terms for a posited change in environmental conditions. Recently, interest has grown in so-called conjoint stated preference methods that do not ask about willingness-to-pay directly, but instead undertake experiments involving contingent ranking of, or contingent choice among, alternatives that provide different levels of non-marketed public goods or their multidimensional attributes.

In their workshop paper *A Review of the Use of Contingent Valuation Methods in Project Analysis at the Inter-American Development Bank*,¹² IDB

¹² This and other papers from the NSF workshop are available at the U.S. Environmental Protection Agency’s web site at <http://www.camerata.net/epa/wpi.nsf/frames>

economists Sergio Ardila, Ricardo Quiroga and William J. Vaughan look at over ten years of Bank’s experience with stated preference methods, concentrating on their use in the cost-benefit analysis of projects supplying sewer service and improving ambient water quality in Latin America and the Caribbean. The paper discusses the characteristics of nearly a score of projects, and the nature of the analysis undertaken to design and approve them. It reports the range in household benefit (willingness-to-pay) estimates involved, and comments on some of the most important economic analysis issues that appear to have arisen. Among these are the effect that alternative econometric specifications of the choice model can have on estimates of average (or median) household willingness-to-pay derived from referendum CV surveys, the need to match what any investment project purports to achieve in a CV survey to what it will actually achieve in practice, and the role of sensitivity analysis in portraying the distribution of expected gross and net project benefits.

The authors find that the revealed preference method of hedonic analysis has rapidly given way to contingent valuation as an approach to environmental benefit estimation in project analysis, but few, if any, “nontraditional” conjoint applications have been undertaken. Some promising areas for the IDB’s future application of these new, less familiar methods are suggested, as are some more conventional needs.

EVALUATION STUDIES ON THE ENVIRONMENTAL REGULATION AND SUPERVISION OF INFRASTRUCTURE INVESTMENTS

Bank-financed projects are designed to safeguard key features of the natural environment and to mitigate potentially negative effects of investments. While loan contracts contain components and conditions introduced to ensure adherence to Bank and country

The paper is also available from the IDB in hard copy or on the Environment Division’s web site www.iadb.org/sds/enve.cfm

guidelines, compliance is largely dependent upon the effectiveness of environmental management measures and procedures in place (or not) during implementation. In 1997, the Evaluation Office (EVO) initiated a work program, continued throughout 1998, to assess the institutional and technical capacity of public and private executing agencies to manage infrastructure investments according to agreed-upon environmental standards.

Within a country, no one project, on its own, is likely to be the catalyst for significant and sustainable institutional transformation. Rather, a more realistic expectation would be for capacity building to occur incrementally with the implementation of sequential projects within a sector. This EVO activity analyzed individual projects as part of a process of institutional development. It included the evaluation of capacities existing before projects, in their early stages, during implementation and afterwards—a trends analysis of the institutional learning process. In this context, effective performance of the environmental management function is seen to be predicated on the strengthening of institutions in several domains including, but not limited to: legislation, organizational structure, technical norms, training, equipment, information exchange, and decentralizing the capacity to monitor and respond expeditiously to “environmental situations.”

The overall evaluation focuses on those investments which are most likely to cause environmental concerns; namely, large-scale infrastructure projects. Of particular interest are those projects whose conception, design, or execution were influenced by the mandates of the Seventh and Eighth Replenishments. In addition, since 1990, the Bank has approved procedures for classifying and assessing environmental impacts and has developed operations specifically designed to address environmental challenges in the region. The projects selected for ex-post evaluation reflect some of these changes, if not in their design, at least in their implementation.

This series of evaluations included five project performance reviews in two sectors (three highway and two hydroelectric power projects) and a final

summary report. Two transport sector studies were completed in 1997: Highway Improvement Program Chile (CH-0041), Arica - Tambo Quemado (Loan 613/OC-CH) and Road Rehabilitation Program for the State of Ceará (Loans 587/OC-BR and 833/SF-BR). The remaining studies were completed in 1998: Patacamaya - Tambo Quemado Road Project (BO-0106, Loan 840/SF-BO); Pehuenche Hydroelectric and Associated Transmission Project (CH-0116, Loan 218/IC-CH); and the Segredo Hydroelectric Project (BR-0061, Loan 593/OC-BR).

REGIONAL RESEARCH NETWORK STUDIES FINANCED BY THE BANK

Public research organizations from Argentina, Brazil, Colombia, Chile, Mexico and Venezuela, jointly with the International Service for National Agricultural Research (ISNAR, one of the International Agricultural Research Centers associated with the CGIAR) have conducted two years of collaborative research on how to integrate new demands for agricultural research, particularly those focusing on agroindustry and natural resources research. In the future, the relative importance of natural resource management and of agroindustry vis-à-vis primary agricultural production is bound to rise. Responding to this trend in an adequate manner will enhance the contribution of agricultural research to economic development. The project has explored how agricultural research will change with the integration of agroindustrial and natural resource management perspectives. The nature of these new demands is quite different when taking into account time research lags, public and private sector involvement, clientele, legal support required, funding sources, priority setting, and research organization.

The project conducted six case studies and developed policy, planning and management methodologies to address these new demands in a satisfactory manner. Methodologies were concerned with strategic, long-term institutional decisions on the role and position of different research institutions; the user-led definition of programs for technology generation and diffusion; the implementation of user friendly approaches to evaluate the environmental impact of

technologies; and the principles for establishing successful linkages between public research institutes and private agroindustries. The project is distributing seven research reports, two training modules on research management and a synthesis paper. Two international training workshops and an international seminar for the national leaders of agricultural research were organized. At the request of the national research leaders a follow-up project proposal is being prepared and funding possibilities are being explored.

Several chapters in the book *Spilled Water: Institutional Commitment in the Provision of Water Services* (mentioned above) are based on studies undertaken through the Bank's Latin American Research Network. In 1997, the Office of the Chief Economist released them as separate working papers, some (but not all) of which were mentioned in last year's Annual Report.

The paper *Regulation, Organization and Incentives: The Political Economy of Potable Water Services in Honduras* by I. Walker, M. Velasquez, F. Ordoñez and F. Rodriguez analyzes the poor performance of the water sector in Honduras, and shows how a "low-level equilibrium" is maintained by keeping rates too low to finance the efficient expansion of services. The study compares the performance of the national water authority (SANAA) with various municipal services and, in this context, reviews the current reform debate over regionalization and municipalization. It argues that the key issue is not municipal versus national control of service provision, but whether the system operates free of direct political control and whether all types of service providers are adequately regulated. It documents the sector's continued dependence on external funds to support investment and the gross inefficiencies of operations. It goes on to show that consumers are relatively less willing to accept higher rates in return for promises of improved performance when dealing with public entities that lack credibility, than they are with private or community controlled entities. The paper concludes with a stakeholder analysis that suggests ways to break out of the low level equilibrium and establish a more efficient sector.

Grupo Macroconsult's study *Retos de Economía Política en Agua Potable: El Proceso de Reforma en Perú*, analyzes the water and sanitation sector in Peru since 1990 as it changes from a highly centralized structure to one that assigns primary responsibility to municipalities. The paper shows how the reforms of the water and sanitation sector have been largely driven by political factors external to the sector, including the APRA government's effort to fragment power in its final days of office or the current government's interruption of the privatization of SEDAPAL prior to elections. It also demonstrates the fragility of the sector's financial sources, which depend heavily upon payroll taxes, themselves subjects of reform debates.

The study also compares the performance of three water companies —SEDAQOSQO, SEDAPAL, and SEDAPIURA—in the face of this changing political-economic context. The comparison of water and sanitation companies demonstrates that SEDAPAL has improved its performance and performs better on various efficiency measures than the municipal firms. This improved performance is attributed to the tutelage of external financing agencies which introduced a stakeholder with an interest in efficiency. By contrast, the municipal water companies are unable to break the vicious cycle of low tariffs, insufficient funds, inefficient operation, and political interference. However, SEDAPAL's current arrangement is unlikely to sustain its efficiency gains without continuing external involvement. The study concludes with a discussion of policy alternatives, giving special attention to the potential role of the private sector and a new regulatory framework.

The Instituto Tecnológico de Estudios Superiores de Monterrey focuses on the performance of Mexico's public water companies during a gradual process of decentralization in *Regulation, Organization and Incentives: The Political Economy of Potable Water Services in Mexico*. Perhaps more than any other country, the water sector in Mexico was once highly centralized in the federal government. Since the 1980s, the states have assumed much of the responsibility and a variety of arrangements have developed. In some states, the centralized system has been

recreated at the state level, with normative and operational responsibilities combined in a state water company. In other cases, normative and operational functions have been separated. In still others, municipalities have assumed normative and operational responsibilities. An econometric evaluation of more than 200 water companies shows that there are few economies of scale in Mexico's water sector, that firms are generally quite inefficient, and that the existence of a modern water law has little impact on efficiency. Most importantly, the study shows that municipal firms operate more efficiently than state-level authorities, whether or not they have separated normative and operational functions. This suggests that the low-level equilibrium experienced at the federal level may be broken by linking service provision, and decisions over investment and water rates, to authorities which are more closely related to the service area in question.

Governance and water regulation in Chile is the subject of a paper by F. Morande and J. Doña entitled *Los Servicios de Agua Potable en Chile: Condicionantes, Institucionalidad, y Aspectos de Economía Política*. This study analyzes the transition of Chile's water and sanitation services from a centralized public sector activity to a more decentralized one with a highly developed regulatory framework and the beginnings of private sector involvement in various forms. The study argues that private sector involvement in the provision of water services has been slower than in other sectors (such as telephones and electricity) because consumers were relatively content with the performance of public firms and private investors were less interested. In reviewing the current debates, the study notes the relative absence of consumers from the discussion, and low resistance from employees. Part of the reason that consumers have accepted substantial increases in water rates is due to the introduction of a demand subsidy that is effectively targeted to poorer households. Most of the debate over the proper regulation of the water sector has been affected by perceived problems with respect to privatization initiatives in other sectors. The study contains detailed information on the legal and regulatory framework, along with comparative data on the

various regional water companies.

Two water concessions are compared and contrasted in *La Regulación Económica en las Concesiones de Agua Potable y Desagües Cloacales en Buenos Aires y Corrientes, Argentina* by D. Artana, F. Navajas and S. Urbizondo. Traditionally in Argentina, the water sector has been managed by the public sector. However, in the last ten years, Argentina has experimented with private participation on a scale and at a pace beyond that of other countries in Latin America. This study analyzes the first two concessions granted in Argentina, in the province of Corrientes and the city of Buenos Aires. It explores the relative advantages of the two concession processes, regulatory frameworks and institutional contexts. It shows how these differences may have affected both the resulting performance of the two water companies and the post-contract negotiations, although the short time frame limits the ability to make strong conclusions. The study demonstrates the impact of both the institutional and political context on the outcomes of concession arrangements, and highlights the strengths and weaknesses of the various actors involved in the process of improving water services with private sector participation.

FONTAGRO

The Regional Fund for Agricultural Technology (FONTAGRO) was formally created and placed under the IDB administrative umbrella in 1997. In 1998 it initiated funding regional and subregional agricultural research projects that are chosen on a competitive basis.

The Fund's *Manual of Operations* (2nd ed., July 1998) explains the organizational structure of the Fund, and the process for research proposal preparation, selection, and execution. A comprehensive introduction to the Regional Fund for U.S. institutions and members of the U.S. agricultural research community is available in Special Report No. 1, *FONTAGRO's Potential Cooperation with U.S. Research Organizations*. In March, FONTAGRO released the working paper *Evaluación Económica de Nuevas Tecnologías Agropecuarias: Multimer-*

cados, Zonificación Agroecológica, Transferencia de Tecnología by H. Medina Castro and S. R. Wood.¹³ It presents an approach to the ex-ante economic evaluation of new agricultural technologies that can be used to estimate their potential long term benefits, impacts, and advantages/disadvantages. These and other publications can be viewed on the Fund's web site at <http://www.fontagro.org>.

TECHNICAL PAPERS AND GUIDELINES PRODUCED BY THE ENVIRONMENT DIVISION OF SDS

Strategies

In 1998, strategy documents and their accompanying background papers were released for energy, rural poverty reduction, coastal and marine resources management, and integrated water resources management. The energy strategy is treated at length in Chapter II.. The other strategies were discussed in the 1996 and 1997 Annual Reports. For additional information, including downloadable files of these publications, the reader is referred to the Environment Division's web site at <http://www.iadb.org/sds/enve.cfm>.

Rural Development

A policy guideline study on land markets was finished during 1998, as a follow up on the recently approved rural poverty reduction strategy, *Perspectivas sobre mercados de tierras rurales en América Latina*¹⁴ (Ruben Echeverría, ed.) includes papers prepared by Frank Vogelgesang on land markets and the state; by Jolyne Melmed-Sanjak on land markets in Central America; by Bastiaan Reydon and Ludwig Plata on land market policies in Brazil; and by Carlos Felipe Jaramillo on New Strategic Orientations for rural land markets in Latin America. First versions of these papers were presented in a June 1997 IDB-sponsored workshop, and were revised and edited for this volume by Rubén Echeverría, whose introductory chapter summarizes the principal

conclusions and strategic recommendations of the four papers. The highlights fall into five general policy areas.

A legal, administrative, and institutional framework that safeguards land tenure rights is necessary to enhance the effectiveness of the resource-allocating function of land markets. Continued support should be given to strengthen and modernize policies, administrative procedures and institutions throughout the region, with a special focus on the regularization, registry, and cadaster of land titles and land rights. The IDB has been providing support in this area through its regular lending program and should continue and even expand these efforts.

There is a need to develop *modern information systems* covering technical features of land parcels and prevailing conditions in rural sale and rental markets. The IDB can help by sponsoring information exchange between countries, training events to help develop local capacities, and the establishment of such systems.

An expansion of land-lease markets in various forms could help augment access to land by landless or near-landless rural workers and enable more intensive use of currently underutilized agricultural lands. The parallel development of suitable legal instruments and institutions entrusted with the settlement of disputes and with the promotion of new leasing arrangements between small farmers and large rural landowners may be required. The Bank can help support these initiatives through the parallel financing of investments to provide for the productive utilization of leased lands.

Land taxes are politically difficult to institute and administer but can nevertheless be an important tool for improving land use by discouraging the accumulation of underutilized assets. Decentralized units of government tend to be more effective in collecting land taxes, whenever they have a significant degree of control over revenues collected and their use in the local community. Recent macroeconomic changes (e.g. a reduction in inflation) have decreased the speculative value of land and led to a decline in land

¹³ Only available in Spanish.

¹⁴ Available only in Spanish.

prices. This has facilitated the introduction and implementation of taxes on land. The IDB can complement government efforts in this area as part of a comprehensive program of decentralization of public sector services and rural development.

In countries where rural poverty and large disparities in land distribution are predominant, the present macroeconomic setting has given rise to an interest in *market assisted land reform*. Unlike earlier efforts which encountered innumerable stumbling blocks of a political and economic nature, these new efforts seek to enhance the purchasing power of small producers—mainly through State sponsored partial grants—enabling them to purchase and put into production small parcels of land. There are many practical difficulties along the way; these funds have the potential to distort the market prices of land and can provide fertile grounds for corruption. Nevertheless, given the significant potential gains involved, some experimentation with such mechanisms is warranted. The IDB in particular, can lend its support by: (i) financing macroeconomic and sectoral reforms which reduce incentives to retain underutilized plots of land as a protection against inflation; (ii) financing experimental market assisted land reform projects; (iii) financing programs which provide for the modernization of “traditional” land settlements and improved market linkages and productivity; and iv) financing pilot projects which allow the purchase of small plots in peri-urban areas, allowing small producers to combine farm with off-farm work.

Forestry, Biodiversity and Habitat Protection

Forestry is generally looked upon as an important activity in rural development. If conducted in a “sustainable” manner, it is widely embraced as a means to maintain forest cover and thereby provide various environmental services such as biodiversity conservation, watershed protection, carbon sequestration, soil conservation, and habitat preservation. Due to a series of constraints outlined in the paper *Replanteamiento de política de contratos de aprovechamiento forestal en América Latina* by

Jared Hardner and Richard Rice,¹⁵ it seems unlikely that the dual objectives of economic development and conservation will be achieved via current forest resource use contracts. This study challenges the current design of such contracts and argues that a radical rethinking is imperative.

Four case studies illustrate current constraints and future opportunities for improving forest resource contract practices. The first, *Bosque Chimanes* in Bolivia, demonstrates that extensive forest management can be both efficient and of relatively low impact without regulatory oversight. Past efforts to mandate “sustainable” management through regulatory force have failed in Chimanes due to financial, silvicultural, and administrative constraints. In Colombia, an industry/community collaborative effort of intensive forest management provides an example of resolving the issues of multiple-use and local user rights that plague many forest resource use contracts in Latin America. The case of Brazil shows that the creation and development of extractive reserves offers insight into the viability of non-timber forest products as economic alternatives to timber production. Finally, in an effort to reduce the burden on State agencies and improve forest management, the government of Chile is experimenting with the transfer of forest concessions to private enterprises for ecotourism development. Based in part on these experiences, the authors analyzed alternative models for forest resource use contracts and suggest contract features that could promote both economic development and forest conservation in Latin America and the Caribbean.

Integrated Water Resources Management

Prácticas recomendables para la elaboración de leyes y regulaciones relacionadas con el recurso hídrico by Miguel Solanes and David Getches is designed to help in the preparation of sustainable and efficient laws and regulations related to water

¹⁵ Available only in Spanish at the Environment Division’s web site at <http://www.iadb.org/sds/enve.cfm>
An English language version appears as a chapter in *Forest Resource Policy in Latin America*.

resource based on internationally accepted principles.¹⁶ The document does not purport to be a “how-to” manual of water legislation. Rather, it is both a guideline on basic principles that can be reflected in laws and regulations, and a reference resource that allows the user to compare and review existing legislation. The paper is a tool for implementing the legal and institutional part of the Bank’s integrated water resources management strategy.

The document *Analytical Framework for Integrated Water Resources Management* prepared by the International Institute of Infrastructure, Hydraulic and Environmental Engineering in Delft, The Netherlands, provides an analytical framework and general guidelines for the assessment of the institutional setting for integrated water resources management (IWRM). It is intended as an aid for project teams that wish to include key IWRM principles in their water-related projects following suggestions in the Bank’s *Strategy for Integrated Water Resources Management*. This framework is based on a participatory development process to move from an identified “present water resources management situation” to some “desired integrated water resources management situation” on the basis of the formulation of specific needed interventions and the establishment of a monitoring system. The guidelines include a list of suggested steps that emphasize the need to involve all relevant stakeholders. The framework and guidelines are developed for Bank project teams, government agencies and other interested stakeholders to facilitate the process of project formulation and monitoring.

Energy

The countries of Central America are making progress in the reforming their power systems and are looking forward to creating an integrated regional electricity market. Establishment of a competitive transboundary electricity market is a challenging enterprise, and the Scandinavian power market is the only extant case of such integration. Financing

¹⁶ Available only in Spanish.

provided by the government of Norway enabled a seminar to be held at Bank headquarters where participants could learn about the Nordic Market, the Colombian Power Pool, and the proposed Brazilian Pool. The discussions summarized in *The Nordic Experience in Integrated Competitive Electricity Markets* suggest lessons for Central America that might be drawn from these experiences.

INDIGENOUS PEOPLES AND COMMUNITY DEVELOPMENT

Involuntary Resettlement

After extensive consultation and discussion, in July 1998, the Bank’s Board of Directors approved an Operational Policy on Involuntary Resettlement.¹⁷ This policy aims to avoid, when possible, displacement of people as a result of Bank funded projects, or to minimize its negative impact by preventing impoverishment and assuring equitable compensation. The policy outlines the basic principles that need to be applied and outlines the criteria for the design and appraisal of a resettlement plan, placing emphasis on community participation, the needs of especially vulnerable population groups, and on monitoring and evaluation. The policy document is accompanied by a background paper, which includes an overview of the findings and conclusions of a desk review of 150 Bank projects that included involuntary resettlement components, and provides further justification as well as some operational implications of the newly approved policy.

Operational guidelines¹⁸ were also issued to assist Bank staff, executing agencies and other parties, in the implementation of the policy. The guidelines provide specific orientation on the preparation of baseline studies, design of resettlement plans,

¹⁷ *Involuntary Resettlement: Operational Policy and Background Paper*, July 1998, IND-103, available in English, Spanish or Portuguese, from Lina Uribe at linau@iadb.org

¹⁸ *Involuntary Resettlement in IDB Projects: Operational Guidelines*, December 1998, IND-104, available in English, Spanish and Portuguese, from the same source.

consultation and participation issues, as well as other methodological and timing related considerations.

Indigenous Groups

In the course of the preparation of an indigenous development strategy, a series of studies was commissioned to provide further understanding about the factors behind the high degree of correlation observed between poverty indicators and ethnic affiliation. The first of these studies, *Issues in Indigenous Poverty and Development*,¹⁹ explores the relationship

of indigenous peoples to land, labor and markets, concluding that the determinants of indigenous material poverty can be found in their disadvantaged access to these resources, rather than in the limitations inherent in a subsistence based mode of production. Therefore, the study argues that, especially for the large majority of indigenous people who live in the highland areas of Latin America, community based development projects may be less important than the need to reform the broader economic and social framework so that indigenous people can participate in development on their terms, consistent with their economic, social and cultural characteristics, needs and aspirations.

¹⁹ Plant R. *Issues in Indigenous Poverty and Development*, December 1998, IND-105, available in English and Spanish, from the same source.

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