Final Report

An Impact Assessment and Framework for Discussing the 2003–2007 Strategic Plan of the USAID/Brazil Environment Program

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An Impact Assessment and Framework for Discussing the 2003–2007 Strategic Plan of the USAID/Brazil Environment Program

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Appendices

List of Acronyms

A2R	A2R Environmental Investment Fund *(A2R Fundos Ambientais)*
ANA	National Water Agency *(Agência Nacional de Aguas)*
AO	Agency Objectives
BDFFP	Biological Dynamics of Forest Fragments Project *(Projeto de Dinâmica Biológica de Fragmentos Florestais)*
BNDES	National Bank of Economic and Social Development *(Banco Nacional de Desenvolvimento Econômico e Social)*
CCD	Convention to Combat Desertification
CDB	Convention on Biological Diversity *(Convenção de Diversidade Biológica)*
CDM	Clean Development Mechanism
CDSA21	Agenda 21 Committee on Sustainable Development
CE	Ecological Corridors Project *(Projeto de Corredores Ecológicos)*
CI	Conservation International
CIFOR	Center for International Forestry Research
CNA	National Confederation of Agriculture *(Confederação Nacional da Agricultura)*
CNI	National Confederation of Industry *(Confederação Nacional da Indústria)*
CNS	National Rubber Tappers Council *(Conselho Nacional dos Seringueiros)*
CONTAG	National Confederation of Rural Workers *(Confederação Nacional dos Trabalhadores na Agricultura)*
CONAMA	National Environment Council *(Conselho Nacional de Meio Ambiente)*
CTO	Cognizant Technical Officer
DfID	U.K.'s Department for International Development
ED	Environmental Defense
EIA	Environmental Impact Assessment
EMBRAPA	Brazilian Agricultural Research Enterprise *(Empresa Brasileira de Pesquisa Agropecuária)*
EMBRATER	Brazilian Agricultural Extension Agency *(Empresa Brasileira de Assistência Técnica e Extensão Rural)*
EPA	Environmental Protection Agency
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantity Contract
FAB	Brazilian Air Force *(Força Aérea Brasileira)*
FAOR	Eastern Amazon Forum *(Fórum da Amazônia Oriental)*
FASE	Federation of Organizations for Social and Educational Assistance *(Federação de Orgãos de Assistência Social e Educacional)*
FETAGRI	Federation of Agricultural Workers *(Federação dos Trabalhadores na Agricultura)*
FFT	Tropical Forest Foundation – Brazilian Branch *(Fundação Florestas Tropicais)*

FIOCRUZ	Oswaldo Cruz Foundation *(Fundação Oswaldo Cruz)*
FLONAS	National Forests *(Florestas Nacionais)*
FNMA	National Environment Fund (*Fundo Nacional do Meio Ambiente)*
FOE	Friends of the Earth
FORAM	Permanent Forum for Debates on the Amazon *(Fórum Permanente de Debates da Amazônia)*
FPE	State Participation Fund *(Fundo de Participação dos Estados)*
FPM	Municipal Participation Fund *(Fundo de Participação dos Municípios)*
FSC	Forest Stewardship Council
FUNAI	National Indian Foundation *(Fundação Nacional do Índio)*
FVA	*Fundação Vitória Amazônica*
FY	Fiscal Year
GCC	Global Climate Change
GEF	Global Environment Facility *(Fundo para o Meio Ambiente Mundial)*
G/ENV	Global Bureau Environment Center (USAID)
G7	Group of Seven Leading Industrialized Nations
GIS	Geographic Information System
GNP	Gross National Product
GOB	Government of Brazil
GTA	Amazon Working Group *(Grupo de Trabalho Amazônico)*
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources *(Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis)*
IBASE	Brazilian Institute for Social Analysis *(Instituto Brasileiro de Análises Sociais)*
IBDF	Brazilian Forestry Development Institute *(Instituto Brasileiro de Desenvolvimento Florestal)*
ICMS	Value Added Tax
IDB	Inter-American Development Bank *(Banco Interamericano de Desenvolvimento)*
IEC	Information, Education and Communication
IESB	Institute for Social and Environmental Studies of Southern Bahía *(Instituto de Estudos Sócio-ambientais do Sul da Bahia)*
IFI	International Financial Institution
IISD	International Institute for Sustainable Development
IMAZON	Amazon Institute of Man and the Environment *(Instituto do Homem e Meio Ambiente da Amazônia)*
INCRA	National Institute of Resettlement and Agrarian Reform *(Instituto Nacional de Colonização e Reforma Agrária)*
INPA	National Research Institute of the Amazon *(Instituto Nacional de Pesquisas da Amazônia)*
INPE	National Space Research Institute *(Instituto Nacional de Pesquisas Espaciais)*

IPAM	Environmental Research Institute of the Amazon *(Instituto de Pesquisa Ambiental da Amazonia)*
IPE	Institute of Ecological Research *(Instituto de Pesquisas Ecológicas)*
IQC	Indefinite Quantity Contract
IRG	International Resources Group, Ltd.
ISA	Socio-environmental Institute
ISPN	Institute for Society, Population and Nature *(Instituto Sociedade, População e Natureza)*
ITTO	International Tropical Timber Organization *(Organização Internacional de Madeiras Tropicais)*
LAC	Latin America and Caribbean Bureau of USAID
LBA	Large Scale Biosphere-Atmosphere Experiment in Amazonia
LCA	Environmental Crimes Law
LEAD	Leadership for Environment and Development *(ABDL–Associação Brasileira para o Desenvolvimento de Lideranças)*
MA	Ministry of Agriculture and Supply *(Ministério da Agricultura e do Abastecimento)*
MCT	Ministry of Science and Technology *(Ministério de Ciência e Tecnologia)*
MDA	Ministry of Agrarian Development *(Ministério do Desenvolvimento Agrário)*
ME	Ministry of Education *(Ministério da Educação)*
MERGE	Managing Ecosystems and Resources with Gender Emphasis
MF	Ministry of Finance *(Ministério da Fazenda)*
MI	Ministry of National Integration *(Ministério da Integração Nacional)*
MJ	Ministry of Justice *(Ministério da Justiça)*
MMA	Ministry of Environment *(Ministério do Meio Ambiente)*
MPEG	Emilio Goeldi Museum of Pará *(Museu Paraense Emilio Goeldi)*
MPOG	Ministry of Planning, Budget and Management *(Ministério de Planejamento, Orçamento e Gestão)*
MPP	Mission Program Plan
MS	Ministry of Health *(Ministério da Saúde)*
NASA	National Aeronautics and Space Administration
NGO	Non-governmental organization *(organização não governamental)*
NOAA	National Oceanic and Atmospheric Administration
OTS	Organization for Tropical Studies
PAHO	Pan American Health Organization *(Organização Panamericana da Saúde)*
PDBFF	Biological Dynamics of Forest Fragments Project *(Projeto de Dinâmica Biológica de Fragmentos Florestais)*

PESA	Participatory Socio-environmental Research Methodology for Rural Areas *(Metodologia de pesquisa participativa em áreas rurais desenvolvida pela Universidade da Flórida)*
PESACRE	Research and Extension in Agroforestry Systems Group-State of Acre *(Grupo de Pesquisa e Extensão Agroflorestal do Acre)*
PiP	Parks in Peril
PLANAFLORO	Rondônia Natural Resources Management Project *(Plano Agropecuário e Florestal de Rondônia)*
PNMA	National Environment Program *(Programa Nacional de Meio Ambiente)*
POEMA	Poverty and Environment in Amazonia *(Pobreza e Meio Ambiente na Amazônia)*
PPA	Pluriannual Plan *(Plano Plurianual)*
PPC	Policy and Program Coordination Bureau of USAID
PPG-7	Pilot Program to Conserve the Brazilian Rain Forest (*Programa Piloto para Proteção das Florestas Tropicais do Brasil)*
PPTAL	Integrated Project for Protection of Indigenous Lands and Populations in the Legal Amazon *(Projeto Integrado de Proteção às Terras e Populações Indígenas da Amazônia Legal)*
PROBEM	Brazilian Program of Molecular Ecology for Sustainable Use of the Biodiversity of the Amazon *(Programa Brasileiro de Ecologia Molecular para o Uso Sustentável da Biodiversidade da Amazônia)*
PRODEAGRO	Program of Agroenvironmental Development of the State of Mato Grosso *(Programa de Desenvolvimento Agroambiental do Estado do Mato Grosso)*
PROECOTUR	Program for Development of Ecotourism in the Legal Amazon *(Programa de Desenvolvimento do Ecoturismo da Amazônia Legal)*
PRONABIO	National Program of Biological Diversity *(Programa Nacional da Diversidade Biológica)*
PROTEGER	Fire Prevention, Mobilization and Training Project *(Projeto de Mobilização e Capacitação em Prevenção aos Incêndios Florestais na Amazônia)*
PSW	Pacific Southwest Research Station (USDA/FS)
PVO	Private Voluntary Organization
R4	Results Review and Resource Request
RMA	Atlantic Forest Network *(Rede Mata Altântica)*
RPPN	Official Private Natural Reserve
RSD	Regional Sustainable Development of USAID/LAC
SAE	Secretariat of Strategic Affairs *(Secretaria de Assuntos Estratégicos)*
SAF	Agro-forestry Systems *(Sistemas Agroflorestais)*
SCA	Secretariat of the Amazon *(Secretaria de Coordenação da Amazônia)*
SEFE	Executive Secretariat of Forests and Extractivism *(Secretaria Executiva de Florestas e Extrativismo)*

SI	Smithsonian Institution
SIPAM	System of Amazon Protection
SISNAMA	National Environment System *(Sistema Nacional de Meio Ambiente)*
SIVAM	System of Amazon Surveillance *(Sistema de Vigilância da Amazônia)*
SNUC	National System of Conservation Units *(Sistema Nacional de Unidades de Conservação)*
SO	Strategic Objective
SOW	Statement of Work
SP	Strategic Plan
SPVS	Society for Wildlife Research and Environmental Education *(Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental)*
SUDEPE	Superintendency for the Development of Fishing *(Superintendência para o Desenvolvimento da Pesca)*
SUDHEVEA	Superintendency for Rubber *(Superintendência da Borracha)*
SUNY	State University of New York
TFF	Tropical Forest Foundation
TNC	The Nature Conservancy
UF	University of Florida
UN	United Nations
UNDP	United Nations Development Program *(Programa das Nações Unidas para o Desenvolvimento)*
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USDA/FS	USDA Forest Service
USG	United States Government
USGS	United States Geological Survey
WB	World Bank
WHRC	Woods Hole Research Center
WWF	World Wildlife Fund *(Fundo Mundial para a Natureza)*
ZEE	Ecological-Economic Zoning *(Zoneamento Ecológico-Econômico)*

Executive Summary

From November 6 to December 4, 2000, a five-member team fielded under the EPIQ IQC undertook an assessment of the USAID/Brazil Environment Program and, based on its findings, proposed recommendations for the 2003–2007 Environment Program Strategy. During this period, the Assessment Team met with representatives of all the projects that make up the USAID/Brazil program, interviewed many of its participants, and reviewed program-related reports and other documents.

The Assessment Team found that, despite a relatively limited financial resource base and the absence of a formal bilateral agreement, the USAID/Brazil Environment Program has influenced public policies and has laid the groundwork for significant progress in reducing the threat of biodiversity loss and towards a more complete response to global climate change. At the same time, USAID/Brazil's unique and innovative use of partners has allowed these globally relevant achievements to be translated into on-the-ground efforts of economic value.

More specifically, the Assessment Team found that the Program's impacts had consistently exceeded targets. Program impacts were analyzed according to six categories: 1) technology transfer; 2) training and human resources; 3) organizational development; 4) information, education, and communication; 5) advocacy; and 6) networking. Additionally, the Assessment Team identified several comparative advantages of the USAID/Brazil Environment Program, particularly the integration of conservation and development, experience in working with civil society, work with communities on a long-term basis, flexibility in the mobilization of resources, training and capacity building, and an ability to operate at many scales.

Based on this assessment of impacts and comparative advantages, the Team proposed more than 20 recommendations in three general areas: thematic (12 recommendations), geographic (five recommendations), and structural (seven recommendations). Overall, the Assessment Team recommended a continuation of the Program's general thrust of working with non-governmental organizations (NGOs) and science center partners in the Amazon Basin.

The Team also suggested that, given an increase in the Mission's budget, the same general model should be used to move into other biomes and subject matter areas of international importance in Brazil. Without major changes and in a suggested order of importance, the Program could be extended into the Cerrado to evaluate the potential for sequestration of carbon in biomass and soils and for the protection of its significant biodiversity; to the Pantanal for work in international waters, as well as for continued work on biodiversity protection; to the Caatinga for work on the mitigation of desertification processes; and, finally, to the Atlantic Forest for work on potentially sustainable land uses and their impacts. The Assessment Team encouraged the Program to continue its efforts

to conserve biodiversity and mitigate global climate change and to systematize its work in the institutional development of civil society organizations and small communities within the larger socio-economic and political context of Brazil. The Team further recommended that the model be adapted to include efforts for the integration of private enterprise into the overall process of sustainable development.

Thematic recommendations included support for the following efforts: 1) intensified agricultural production that incorporate more crops and livestock in agro-forestry systems, reduce accidental fires, facilitate land-tenure security, and strengthen extension services; 2) credit and investment for rural families; 3) improved settlement projects through better selection of sites and settlers and appropriate extension services; 4) bridging urban and rural environmental management priorities by linking efforts to reduce deforestation with those to increase economic security; 5) More effective environmental monitoring and enforcement using new monitoring technologies; 6) Certification of forest operations and the establishment of effective production forests; 7) Employ mutual benefits to engage private sector conservation support; 8) training in project environmental impact assessments for economic development projects; and 9) training in quantitative evaluation of ongoing economic and environmental impacts of sustainable production alternatives.

The Team recommended that the Program continue its primary geographic focus on the Amazon, with work following, in priority order, on the Cerrado, Pantanal, Caatinga, and Atlantic Forest biomes.

Programmatic recommendations suggested that the Program request proposals from partners on themes supporting strategic goals under a competitive process and that it should support critical cross-cutting themes, i.e., capacity building, monitoring, and information dissemination. Finally, the Team recommended that the Strategic Goal of the SO1 Results Framework should be adjusted to include work on desertification and international waters.

1. Introduction

In August 2000, the USAID Mission in Brazil requested that the EPIQ IQC assess the USAID/Brazil Environment Program and begin the process of developing a new five-year strategic plan. (Terms of Reference appear in Appendix 1.) During the period November 6 to December 4, 2000, a five-member team met with representatives of all USAID/Brazil Environment Program projects; interviewed many of its participants (Appendix 2); and reviewed relevant, Program-related reports and documents (Appendix 3).

This assessment report focuses on observations and conclusions concerning the Program's successes, as well as on gaps and opportunities not covered in the Mission's current environmental strategy, which looks toward "environmentally and socio-economically sustainable alternatives for sound land use adopted beyond target areas." Based on these findings, the Assessment Team recommendations open a discussion on a strategic framework that will guide USAID/Brazil Environment Program work for five years, beginning in 2003.[1] The social and economic problems facing Brazil are enormous, and the national search for solutions correctly emphasizes these aspects. However, Brazil's influence as both a source of and solution to major global environmental problems is well known. With 40 percent of the world's tropical forests, Brazil is thought to have the richest biodiversity on the planet. However, poverty, the country's use of the natural resources originating in its forested lands, and other factors have caused Brazil to suffer one of the world's highest rates of deforestation. Though its per capita contribution to the exacerbation of global climate change is small, the value of its forests as a sink for carbon makes Brazil a focal point for research and other interests in the growing fight to curtail anticipated global warming.

USAID/Brazil's participation in the search for solutions to these environmental problems is unique. Because Brazil has reached the GNP cut-off level for receiving USAID support, direct international development assistance of the more traditional kind is difficult to justify. Thus, the USAID Mission in Brazil now works only on issues of global importance, such as the study and mitigation of climate change, the reduction of biodiversity loss, renewable energy and energy conservation, and HIV/AIDS prevention. Among these, environmental and the social concerns are highly relevant because of Brazil's natural and socio-economic history. The current arrangement for assistance in Brazil by USAID allows for much more flexibility and quickness of response on emerging problems, and it

[1]As stated in the Terms of Reference, the objective of this assessment was "To provide a review of the effectiveness of the USAID programmatic efforts in the environment in meeting the Mission Strategic Objectives (SOs) and the Mission Program Plan (MPP). To conduct an analysis of gaps and opportunities in the sector to provide a foundation for the review of the Mission Resource Request (Spring 2001) and the next Strategic Plan (2002)." However, USAID staff in Brazil felt that work on the Results Review and Resource Request (R4) should not be part of this assessment effort and that the team should only "develop a framework for discussing the 2003-2007 strategic plan." (See Appendix 1).

allows for the development of special relationships with the local non-governmental organizations (NGOs), universities, and research centers that are the strength of the Program's effort.

The USAID/Brazil Environment Program has focused its attention and relatively limited resources on the Amazon. Through its partner institutions from the U.S. and, in turn, their cooperative alliances with NGOs in Brazil, USAID's fairly broad Environment Program consists of applied research on biodiversity, the dynamics of forested ecosystems, and socio-economic analysis of natural resource management decisions made by communities and individuals. Work on globally significant problems, supported by the enthusiasm and nascent capabilities of small domestic NGOs and science centers, has contributed to the solution of major global problems. Interestingly, this approach has also brought about Program impacts that have influenced many of the socio-economic adjustments required to improve the life quality of the Brazilian population (see box below).

Impact of USAID/Brazil Environment Program

Technology Transfer

- Reduced-impact forest management principles and practices becoming established in commercial operations
- Establishment of a sophisticated forest fire monitoring system through USDA/FS contribution to the Fire Prevention and Control Program at IBAMA
- Application of participatory techniques to achieve a good understanding of local communities
- Application of GIS technologies as a planning tool
- Biological corridor models being adapted from small scale to larger scales
- Capability to monitor, evaluate, and adjust agro-forestry systems, thus facilitating their replication in other areas

Organizational Development

- Support for numerous local NGOs in strategic planning, project design, budgeting, accounting, reporting, management, and fundraising, leading to a better understanding of relationships between societies and their environments
- Work with pre-existing local community organizations leading to improved production and commercialization strategies
- New organizational models based on community participation and stakeholder negotiation emerging from field experiences
- Civil society participation in sustainable development councils at municipal, state, and federal levels
- Pioneer work on land trusts and easements for conservation on private land

Training and Human Resources

- Formal training programs continuing over time, with spreading effects through training efforts of former trainees leading to an expanding environmental capability base
- Shifting formal training from US-based to Brazil-based, thus reducing costs and expanding the pool of potential participants
- Short-course training for mid-career professionals in a wide range of environmental and managerial subjects, mainly targeting land managers, civil service personnel, researchers, and NGO managers
- On-the-job training through the Program partners' activities to prepare personnel for working with government, the private sector, and international agencies
- Environmental awareness development through training lawyers and journalists, who have systemic impacts on the legal structure and public opinion

Information, Education and Communication

- Dissemination of scientific information with published articles appearing in major scientific journals
- Development of environmental education programs for public schools
- Radio and television programs reaching broad sectors of the population, as well as frequent print-media articles
- Web sites development to disseminate Program activities-related information

Advocacy

- Participation of Program partners in advocacy activities focusing on major environmental policy issues, such as the World Bank forest policy, the National System of Conservation Units, and the Environmental Crimes Law
- Development of alliances between partners and non-partners to carry out advocacy work

Networking

- Annual meetings leading to increasing communication and cooperation within the Program
- Networking between Program partners and non-partners through various environment-related forums, working groups, and committees
- Some spontaneous networking has emerged to help the Program reach beyond target areas, especially in dissemination of production practices and products commercialization

This report begins with a discussion of the natural, political, and social context of Brazil's environment sector, followed by an overview of environmental initiatives and programs. Subsequently, it discusses current Program impacts and the comparative advantages of USAID/Brazil for conducting an environmental management program. Lastly, recommendations to facilitate discussion for the preparation of the upcoming strategy for the USAID/Brazil Environment Program appear with a proposed framework for such discussion.

2. Brazil Context

While addressing the context in which the USAID/Brazil Environment Program operates, this section offers a brief synopsis of Brazil's environment sector. It describes the most important biophysical ecosystems (biomes); discusses the main social, economic, and political conditions affecting the sector; and summarizes the major environmental problems affecting Brazilian society.

2.1 Biomes

Notwithstanding the Amazon's significant problems and opportunities, a country as immense and dynamic as Brazil offers many value-added opportunities elsewhere. Brazil's natural biomes—both well-known and globally important—play a significant role in biodiversity conservation and in global climate change mitigation. While the Amazon basin forests are chief among these, the Cerrado, Pantanal, Atlantic Forest, and Caatinga biomes offer equally significant character; the management of the environmental services they provide, including biodiversity conservation and climate change regulation, can serve as models to guide development activities elsewhere in Brazil and in the rest of Latin America.

2.1.1 Amazon Basin

USAID/Brazil has focused 90 percent of its Environment Program in the Amazon Basin, which in Brazil comprises about four million square kilometers of tropical forests and amounts to 47 percent of the country's territory. An estimated 50 percent of the world's biodiversity may be stored in these forests, and their total biomass is claimed to be one of the world's major carbon sequestration sinks. Thus, some 3.78 percent and 6.12 percent of the Basin have been set aside as strictly protected and areas of sustainable management (primarily Extractive Reserves), respectively.[2] Still, deforestation in this biome, which averages close to 15,000 km² a year and reached a figure of almost 30,000 km² in 1994–1995, alarms many. The region's complexities, extremes of heat and humidity, and lack of infrastructure have made much of the Amazon Basin one of the world's least populated areas. These conditions have also led to various less-than-successful efforts at its sustainable development. Despite this, development projects and programs are still attempted, and these initiatives are expected to increase in the years to come.

[2] Conservation Units in Brazil are divided into two distinct categories: those that receive complete protection, such as the National Parks and Ecological Reserves, and those that allow "sustainable" uses such as Extractive Reserves and Official Private Natural Reserves (RPPN). (See Appendix 4 for a listing of Brazil's conservation categories).

2.1.2 Cerrado

The Cerrado covers nearly two million km² in the central, drier portion of the country. Its open, savanna-like vegetation is important for carbon sequestration, especially in its root systems, and the Cerrado also contains a unique and threatened biodiversity. Technological advances to deal with acidity and highly toxic soils have facilitated the biome's agricultural expansion, including ranching and soybean production. However, extensive livestock management, which uses fire to clear woody vegetation and renew the grasses, remains the dominant land use. Although water is scarce during certain seasons, most of the country's rivers have their source in the Cerrado. Unlike the Amazon Basin, which still contains vast areas with little or no human intervention, only a few remnants of pristine Cerrado remain, and these are generally located on private property. Land officially under protection amounts to only 1.47 percent of the biome, and land officially within the sustainable land-use category (primarily Official Private Natural Reserves–RPPN) amounts to only 0.78 percent. Because of its rich biodiversity—called "megadiversity"[3]— and high degree of threat, Conservation International has classified the Cerrado as one of the world's 25 "hotspots."[4]

2.1.3 Pantanal

Compared to the previous two biomes, the Pantanal is small; although at 330,000 km², it is sill the largest freshwater wetland in the world, equal in size to Greece or The Philippines. Located in the central-west part of the country, the Pantanal also includes nearly 100,000 km² in Bolivia and Paraguay. This biome provides a major service in that it holds back the floodwaters of the Upper Paraguay River until those of the neighboring Paraná River system have subsided. Without this flood-control function, the combined flow of the Paraguay and Paraná rivers would threaten all of the population centers located below their confluence at Encarnación, Paraguay.[5] Officially recognized national-level conservation units in this biome are the Pantanal Mato-grossense National Park (140,000 ha) and the Taiama Ecological Station (11,200 ha). More conservation units are proposed, and other state and municipal conservation units exist. However, only about 1 percent of the land is under state or federal control.

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[3] Mittermeier, R.A., P. Robles-Gil, and C.G. Mittermeier. 1997. *Megadiversity:Earth's Biologically Wealthiest Nations.* Cemex, Mexico.

[4] Russell A. Mittermeier, Normal Myers, Cristina Goettsch Mittermeier, Norman Myers. March 2000. *Hotspots: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions.*

[5] Although still a threat, this phenomenon has been abated somewhat by the construction of several reservoirs within the Rio Paraná system.

2.1.4 Caatinga

The Caatinga covers 800,000 km² of Brazil's northeast region and is home to nearly 20 million of the country's poorest people. The northeast, although hot and dry with extremely erratic weather patterns and low rainfall (between 300 and 800 mm annually), boasts an estimated 20,000 plant species. Cattle and goat ranching, as well as irrigated farms along the rivers, have been the primary land uses since colonial times. Firewood cutting to supply steel mills and brick factories has taken its toll on the vegetative cover and, in the last 15 years alone, these combined activities have left a legacy of 40,000 square kilometers of the biome suffering from desertification. Only 0.45 percent of the Caatinga is under complete protection, while an additional 2.91 percent has been placed within a sustainable land-use category.

2.1.5 Atlantic Forest

This forest, located along the Atlantic Coast throughout the length of Brazil and into Paraguay and Argentina, supported the first historical occupation in Brazil. Nearly 70 percent of Brazil's people now live in this region, and continued growth of population centers has severely depleted the Atlantic Forest so that only fragments—7.5 percent of its original 1.2 million square kilometers—remain. Conservation International has classified this forest as one of the five most threatened regions in the world. Despite the fragmentation, however, the forest still contains extremely high levels of diversity and endemism; 50 percent of its tree species and 92 percent of the amphibians occur nowhere else in the world. National and international NGOs have focused their efforts on the Atlantic Forest and, as a result, nearly 6.8 percent of the remaining forest is under protection, while another 21.45 percent is included in the sustainable land-use category. Increasing ecotourism may also help reduce this biome's deforestation rate.

While not as large and complex as the Amazon, Brazil's other biomes—the Cerrado, Pantanal, Atlantic Forest and Caatinga—offer substantial biodiversity values and environmental services of international and local consequence but receive little international attention.[6] Meaningful work on these ecosystems to mitigate desertification processes and to improve our understanding and management of the water cycle can be undertaken through arrangements similar to those that have worked so well for the USAID/Brazil Environment Program.

2.2 Social, Economic and Political Context

Brazil, an advanced developing country of continental size (8.51 million square kilometers), has a population of 169 million inhabitants, according to the year 2000 census. Eighty percent of this

[6] At the time this was being written, however, the Inter-American Development Bank (IDB) announced a US$82 million loan for a "Plan to Protect Brazil's Pantanal."

population lives in urban areas. The nation's economy, the tenth largest in the world, has an annual GNP of approximately US$930 billion; it also has one of the largest external debts among the developing nations—nearly US$265 billion. Servicing of this debt has major repercussions on the shape, pace, and environmental impact of the nation's development.

The external debt is a critical factor in the federal government's current policies to maximize exports via a range of initiatives, including large-scale infrastructure projects (e.g., roads, Hydrovia) to facilitate transport to coastal ports. It also affects the wide-ranging cuts in federal programs, which, in turn, influence efforts to reduce biodiversity loss and mitigate global climate change.

Until World War II, Brazil was predominantly rural with an agriculturally based economy, but only a few of its commodities entered international markets in significant amounts (e.g., sugar, coffee, rubber). The population, although concentrated in the eastern coastal areas, was far less urban than today. Since then, the country has witnessed several waves of migration to urban areas, stimulated by large-scale investments in industrialization. Migration to the interior was initiated with the new federal capital, built in 1960, and by the policies of the military governments during the late 1960s, 1970s, and 1980s, which directed efforts toward major state-led development projects in the Amazon, including roads, railroads, hydroelectric plants and mining operations. Large ranching operations, timber enterprises, and planned settlement programs received incentives. Funds for these initiatives, borrowed from international financing institutions, increased Brazil's external debt.

Early efforts at planned Amazon settlement are considered flawed. Many of the colonists who settled along the new roads were forced to sell their lands cheaply, or the land was simply abandoned for lack of adequate inputs, credit, markets, education, health care, and tenure security. This led to a new wave of rural–urban migration within the Amazon that increased environmental and social problems in the region's major cities.

The dynamics of land use in the Amazon over the past 40 years have entailed both social costs and the loss of natural resources. Historically and currently, small and large-scale farming, ranching, and forestry activities place minimal investment in labor and capital per unit area and pay little attention to long-term productivity. The land's short productive span is followed by degradation and abandonment, whereupon colonists move to areas of uncut forest. Insecure land tenure, a lack of sustainable production models, and the absence of regulations governing the clearing of mature forest all contribute to the further deterioration of the Amazonian biome.

In the 1990s, the government lowered fiscal and financial incentives to cattle ranching, mining, and timber extraction projects, but illegal logging, mining, and cattle grazing are still commonplace. The government now implements a strategy to expand and improve transportation infrastructure to increase grain exports, particularly soybeans, but this approach lacks adequate study of its likely environmental impact. This expansion will certainly add even greater pressure along the

"deforestation belt," which covers roughly the southern and eastern portions of an imaginary line that reaches from Rondônia through northern Mato Grosso to eastern Pará.

Efforts to establish a conservation-oriented environmental program in Brazil must take into account the country's overwhelmingly urban nature. Approximately 80 percent of its population live in urban areas with extensive poverty and inadequate public investment in sanitation and health infrastructure. The vast majority of Brazil's remaining indigenous populations (325,000) live in the North. The Northeast is the country's poorest region, and the Center-West houses the federal capital. The Southeast is the most industrialized area, and the South has high levels of development.

Popluation Distribution in Brazil

Region	Territory	Population
North	42%	17 million
Northeast	18%	46.5 million
Center–West	22%	12 million
Southeast	10%	68.5 million
South	8%	24.7 million

After the 1964 coup, the country remained under military control until 1985, when a civilian president took office. The 1988 Constitution formally established citizen rights (e.g., freedom of speech, right of labor to strike, abolition of torture), as well as rights to health and a "balanced environment." The federal government has a bicameral congress. In state government, the governor's power is balanced by a state legislature. Brazil has some 5,500 municipalities, where the mayor shares power with the municipal council. "Re-democratization" efforts begun in the late 1980s have paid attention to the traditionally excluded (the poor, children, and women); decentralization of programs, expertise, and resources to states and municipalities; and greater civil participation in society, improved government accountability, and increased transparency of decisions and operations.

2.3 Environmental Problems

Biodiversity loss and global climate change are often identified as major problems in Brazil because it has an estimated 50 percent of the world's biodiversity. While the Amazon Basin has the country's richest biodiversity, it is under less pressure than the highly fragmented Atlantic Forest and the Cerrado, identified by Conservation International as two of the world's 25 biodiversity "hotspots." Biodiversity loss in Brazil is directly related to the expansion and intensification of agriculture, logging, and ranching in the Amazon, Cerrado, and Atlantic Forest.

There is also deep concern about Brazil's forest loss and global climate change. Tropical forests play an important role in the dynamics of carbon flux in that they remove carbon dioxide, a major greenhouse gas, from the atmosphere and store it in biomass and soils. Carbon sequestered in the Brazilian forests is estimated at between 518 and 1,245 billion tons (140 to 350 tons/ha).[7] Brazilian contributions to global carbon emissions, estimated at six percent of the world's net emissions, come mainly from land-use practices, unlike contributions of developed countries.

A 1992 study previous to the United Nations (UN) Earth Summit showed that Brazilians considered their major environmental problems to be somewhat differ han those expressed by non-Brazilians (see box). While deforestation ranked highest in concern, urban, water, social, and political issues followed. In 1997, a broader but similar study carried out in conjunction with the Rio+5 conference, came to the same conclusions except that the urban issues replaced forestry issues.

Brazilian public opinion regarding environmental quality priorities displays important differences between the northern and southern parts of the country. For the majority in the Southeast and South, the integrity of the Amazon has become a centerpiece of national values. This segment of the population expects significant areas of the region to be protected and its natural resources to be used in sustainable ways. In addition, Amazonian development through major projects with international capital is generally opposed. However, those living in the Amazon, most of whom live in urban areas, generally desire more development, infrastructure and jobs to reduce the enormous poverty of the region.

Priority Environmental Issues for Brazilians

- Forestry, mainly deforestation
- Urban
  - sanitation
  - waste
  - transportation
  - subnormal housing
  - population density
  - industrial pollution
- Water
- Social
  - poverty
  - unemployment
  - poor education
  - lack of land reform
  - health questions
- Political,
  - lack of integrated environmental and development policies
  - poor sustainable development models
  - lack of political will
  - market limitations
  - shortcomings of the NGOs
- Soil, especially erosion
- Nuclear
- Preservation
- Global

[7] The large variation in the figures is due to differences in evaluation methods, accuracy of original data, and how the data are extrapolated.

2.3.1 Deforestation

Some 15 percent (560,000 km^2) of the Amazon rain forest has been deforested and rates oscillate between 11,000 and 22,000 km^2 of deforestation each year. The reasons for this highly complex phenomenon are only partially known. For example, private investors with sufficient capital and competence to take advantage of public incentives for infrastructure and production are a part of the deforestation problem, as are social movements that gain access to land. Small farmers in colonization or settlement areas also increase deforestation, as do electoral politics. On the other hand, migration from rural to urban areas decreases deforestation but contributes to urban problems. Public environmental management, satellite monitoring, and enforcement of command-and-control legislation help to decrease deforestation as well. Finally, changes in economics and climate can either increase or decrease deforestation depending on cyclical movements. These factors all interact in a dynamic fashion and make precise identification of causes difficult to determine. The net result, though, is often harmful to local populations.

2.3.2 Fires

Fire poses one of the most serious problems in the Amazon. Fires cause biodiversity loss, destroy the potential goods and services available from mature forests, impoverish and degrade soils in the long term, release carbon to the atmosphere, reduce carbon sequestration, create health problems, and make the disturbed landscapes even more susceptible to future fires.While fire is a traditional tool used to clear and prepare land for agriculture, farmers often have limited understanding of fire dynamics. Further, with few tools and equipment to limit its spread, fire frequently burns out of control and moves beyond the intended area of treatment.

In the last few years, especially after the 1997/1998 wild fires in Roraima, authorities increased fire-control efforts. Improved satellite technology for fire monitoring has been used, and more accurate fire detection is expected when the environmental monitoring component of the System of Amazon Surveillance (SIVAM) becomes operational in 2001. Training and information dissemination on fire suppression and management techniques are being made available.[8]

Fires can occur in primary forests and in areas that have been cleared. In each case, the dynamics and consequences are different, and only recently have experiments begun to reveal the workings of water and mineral cycles and how they interact with fire.[9]

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[8] The USAID Environment Program has provided Amazon NGOs and communities with funds to successfully train around 120,000 rural farmers in simple fire prevention practices.

[9] USAID Environment Program Partners, i.e., Woods Hole Research Center (WHRC), Environmental Research Institute of the Amazon (IPAM) and the National Aeronautics and Space Administration-funded Large Scale Atmosphere-Biosphere Experiment in Amazonia (NASA-LBA), have done much of this work.

2.3.3 Desertification

Desertification is a common threat in 110 countries and affects 70 percent of the total arid land used for agriculture. As elsewhere, desertification in Brazil (primarily in the Northeast) is linked to poverty. Some 980,000 km^2 of arid land in the Northeast are currently subject to some form of degradation and desertification because of frequent and lengthy droughts and inadequate land-use practices. This zone, known as the drought polygon, covers 11.5 percent of the country and is home to 18 million inhabitants. Besides hunger, health problems, unemployment, and infant mortality, desertification causes migration from the rural, poverty-stricken communities of the Northeast into the Amazon and the large urban areas in south and central Brazil, thus increasing the size and number of social problems.

Deforestation, fire, agriculture, mining, and extensive cattle raising are the major causes of desertification in the northeast. Movement of these processes to less degraded areas as production becomes economically unfeasible aggravates the problem. Ceará, Pernambuco, and Paraíba suffer most from desertification (70 percent of Paraíba is plagued by the problem). Losses to agriculture and ranching due to desertification are estimated to be US$ 300 million annually. As a response to the problem, apart from granting inefficient temporary humanitarian aid, the Brazilian Government plans to divert part of the flow of the Northeast's largest river, the São Francisco, to provide water for arid areas in four northeastern states.

2.3.4 Urban Environmental Problems

Brazil suffers from a series of urban environmental problems created by poor sanitation and pollution in the highly populated areas of the Southeast and in small areas of the Northeast and South. Although Brazil's environmental protection policies have been in place for 29 years, several pollution problems remain, and the costs of economic, health, and ecosystem losses greatly exceed the country's expenditures in pollution control. Brazil's major urban environmental problems are derived from: 1) a lack of basic sanitation (safe water supply and sewage treatment); 2) surface water pollution in bays, beaches, rivers and creeks; 3) localized pollution by hazardous industrial substances; 4) air pollution in large cities; and 5) municipal-level deficiencies in solid waste collection, treatment, reuse, and disposal.[10]

An estimated 18 million citizens in urban areas and 29.6 million in rural areas still lack safe drinking water. In addition, 35 percent of the country's urban population has no access to safe sewage disposal and, in rural areas, sewage networks are unavailable, although septic tanks are adequate for areas

[10] According to a 1998 World Bank study (World Bank 1998 a & b), these problems are related to 1) excessive reliance on government funding; 2) lack of prioritization of problems and cost-effective interventions; 3) lack of integration in sectoral and spatial policies and planning; 4) outdated approaches of command and control rather than economic and market-based strategies; and 5) lack of effective implementation, application, and enforcement of anti-pollution laws.

with low population. Rivers and other water bodies in urban areas are commonly used for open sewage and industrial discharges or solid waste dumps and cause health problems that affect all major cities in Brazil. The total costs from surface water pollution in urban areas are estimated at US$300 million annually without considering damage to ecosystems and lost tourism. Modernization of water supply and sewage services will require startup investments of US$13 billion plus US$1.7 billion for annual maintenance.

Localized hazardous waste contamination is evident in all major metropolitan areas, both inland and in coastal regions where clusters of large industrial plants are found. Most industrial facilities have poor effluent emission controls and cause socio-economic and environmental damages. Toxic substances, such as mercury from mining activities, also cause problems, especially in the Amazon Basin. Air contamination, a common problem in major metropolitan areas, affects nearly 17 million people in São Paulo and 10 million people in Rio de Janeiro.

Problems with solid waste collection, treatment, and disposal; urban land-use planning; storm drainage systems; landslides and flooding; and housing availability all reduce the quality of life in urban areas. An estimated 60 percent of the country's daily production of solid waste is collected and only 28 percent of that receives adequate treatment and disposal. An estimated US$420 million per year would be necessary to collect and properly dispose of the 40 percent that remains uncollected.

Resolution of urban pollution problems in Brazil will require significant funding and an integrated approach to development planning. More private financing based on cost-effective strategies in water and sanitation and industrial siting and contamination are needed.

3. Environmental Initiatives and Programs in Brazil

3.1 Governmental

A reciprocal relationship between "natural" ecosystems and societal dynamics makes integrated interventions by society a requirement for maintaining healthy a ecosystem. Yet, Brazil still experiences little integration between public policies for economic development and those for resource conservation and preservation. Although many government initiatives address the problems of environmental quality in Brazil (Appendix 5), contradictory policies exist between development and the sustainable use of resources for agriculture, land tenure, transportation, infrastructure, forestry, fisheries, sanitation, tourism, and urban development. While development banks and some government programs, such as agrarian reform and national integration, understand the need to reduce conflicts that arise in development planning and implementation, the government most often perceives the environment as a hindrance to development rather than an opportunity to use natural wealth for social and economic development.

Brazil's Environmental Protection History

1930s	**Water Code**
1966	**Forest Code**
1981	**National Environment Policy** created the **National Environment System (SISNAMA)** SISNAMA includes the **National Environment Council (CONAMA)**
1988	**Constitution** joined SISNAMA in establishing a basis for public environmental policy
1989	**Institute for Environment and Renewable Natural Resources (IBAMA)** created from three government agencies; required to implement environmental policy
1992	**Ministry of Environment (MMA)** created after the UN Conference on Environment and Development to formulate national environmental policy

Brazil's 1988 Constitution joined the 1981 National Environment Policy in establishing a basis for public environmental policy. The National Environment System (SISNAMA) includes the National Environment Council (CONAMA), formed of representatives from federal, state, and municipal governments; the private sector; and civil society. Environmental councils are required by law in municipalities of more than 20,000 inhabitants. In 1989, the Brazilian Institute for Environment and Renewable Natural Resources (IBAMA) grew from three government agencies—Brazilian Forestry Development Institute (IBDF), Superintendency for the Development of Fishing (SUDEPE), and Superintendency for Rubber (SUDHEVEA). The Ministry of Environment (MMA) was created in 1992 after the UN Conference on Environment and Development, with a mandate to formulate national environmental policy, which IBAMA is required to implement. However, a lack of integration and long-term planning, along with inadequate funding,

contribute to the perception that the two agencies compete rather than cooperate on a common environmental agenda.

The Ministry of Environment does not deal directly with the problems created by economic development; these are addressed by other ministries or agencies. This arrangement creates, rather than resolves, environmental conflicts—obvious in recent development initiatives, such as the Araguaia-Tocantins and Paraguay-Paraná waterways, and the Cuiabá-Santarém road. The 1990s saw the creation of many state and municipal environmental agencies wielding uneven institutional power and linked to planning or science and technology secretariats. Only agencies in the most developed states and larger cities have the clout to deal with environmental compliance issues.

Brazil's environmental legislation is poorly enforced; this must change if the country's overall environmental quality is to improve. Progress was achieved after the Law of Environmental Crimes was enacted (1998) in that the environmental agencies can now enforce the law and collect large fines—as, for example, in the case of the year 2000 oil spills in Rio de Janeiro and the Iguaçu River. Economic instruments, despite their potential, especially in pollution-related cases, are still not used and remain a promising area for advancement.

Beyond all these constraints, Brazil's overall fiscal and economic crisis and the limited funding for public environmental management remain the primary impediments to effective government action. Hiring and maintenance of qualified staff; training; enforcement and field inspection; and creation and maintenance of protected areas all require money.

3.2 External Donors

In the 1980s, the burning forests of the Amazon attracted world attention. Since then, external donors have focused on global concerns about biodiversity conservation and carbon emissions due to deforestation. While many Brazilians initially saw international environmental concerns as an infringement of their sovereignty, the 1990s' Rio Conference and G7 Pilot Program to Conserve the Brazilian Rain Forest (PPG-7)[11] made "sustainable development" a legitimate topic for public discussion, and the reduction of deforestation has become an official goal of the Government of Brazil.

Loans from abroad focused on projects that included basic sanitation and pollution cleanups, while international grants tended to concentrate on a conservation agenda for the Amazon and the Atlantic Forest. Approximately 86 percent of funding directed to Atlantic Forest and the Amazon goes for 'pure' scientific, principally biological and ecological, research. Grants from national sources

[11] Sponsored by the Group of Seven leading industrialized nations, i.e., Germany, U.S., U.K., Japan, Italy, France, Canada.

addressed conservation efforts in the southeast region. A relative lack of funding exists for the Caatinga, the Pantanal, the Várzea,[12] coastal plains, and urban ecosystems, and for applied research such as for the use and management of biodiversity and other natural resources. Social sciences, laws, and environmental education also lack funding. Conversely, some thematic areas have received considerable financial support. These include satellite image analysis, analysis and mapping of biodiversity spatial distribution to assist in priority setting for protected areas and biological corridors, and micro- and macro-data collection on the atmospheric effects of different vegetation regimes.

3.3 NGOs

The number of Brazilian national and regional NGOs multiplied in the 1980s and 1990s and received substantial support from abroad. In recent years, support has subsided, despite issues of institutional stability and viability, leaving NGOs to generate their own resources. Many use a socio-environmental approach to problem solving. Generally, they have moved away from being purely critical and now take a more constructive approach in dealing with government at many levels. In addition, they are becoming more adept at project implementation and resource management. These new forms of action require equipment, technical expertise, and higher fixed costs.

Some NGOs receive funding from outside sources and do not always reflect the best interests of the region's populations. In other cases, NGO participation in the governmental deliberation has become more frequent and, in some areas, even a requirement. Questions thus arise concerning how well NGOs represent civil society. Numerous small NGOs in the interior, especially in the Amazon and Cerrado, for example, act as watchdogs and advocates for certain kinds of land use over vast areas. Networks, horizontal exchanges, and various forms of international support are fundamental to the viability and orientation of these organizations.

[12] "Várzea" is the term used in Brazil for an intermittently flooded alluvial plain found along the rivers of the Amazon system.

4. The USAID/Brazil Environment Program and Its Impacts

4.1 General Comments

The concept of "partners" is pivotal in the structure of the USAID/Brazil Environment Program. Generally, partners are strong American institutions that work with local organizations on globally important issues surrounding environmental quality. These institutions understand that humans are the cause of, and the solution to, environmental problems, as well as the ones who gain by having them solved. USAID/Brazil's partners facilitate the transfer of globally relevant ideas and information into the daily activities of communities, at the same time that the partners themselves go about the tasks of discovery and elucidation. This model also provides a means for the transfer and broad acceptance of the sustainability concept while demonstrating its utility at the level of individual activities.

This section analyzes USAID/Brazil Environment Program's impacts outside of its target areas. The findings are based on an analysis of quantitative data supplied by the partners and their allied institutions; on independent evaluations of individual portions of the Program; on site visits, interviews, and reports of annual meetings; and on reviews of a substantial and up-to-date literature. In addition to noting formal goals and their indicators of achievement, the ripple effects that are created when goals are achieved were also considered, as were, where possible, their unintended or unforeseen impacts.

USAID/Brazil has developed a detailed system of performance indicators for intermediate results associated with the first Strategic Objective of the Program (SO1), i.e., "Environmentally and socioeconomically sustainable alternatives for sound land use adopted beyond target areas." The four intermediate results (IRs) are:

Intermediate Result 1: Systems for sound land use identified, promoted and adopted in target areas.

Intermediate Result 2: Target institutions and local human capacity strengthened.

Intermediate Result 3: Target policies to support environmentally sound land use adopted and/or implemented.

Intermediate Result 4: Sound land use systems disseminated beyond target areas.

Each IR relates to a series of activities, such as information gathering, planning, and training, and the results can be aggregated for the Program as a whole. According to the USAID/Brazil Mission, reported results consistently exceeded expectations by a large margin and clearly show that the Program achieved far more than was originally planned, although goals within target areas may have intentionally been cautious to avoid the risk of disappointing results. At the same time, grantees seem reluctant to take credit for impacts that may not be theirs alone.

4.2 Impacts beyond Target Areas

Impacts beyond target areas consistently exceeded the modest character of the targets. To understand the strengths and weaknesses of the Program and to make recommendations, the Assessment Team analyzed impacts beyond target areas according to six categories (technology transfer; organizational development; training and human resources; information, education and communication; advocacy; and networking). While categories may overlap, their differences affect strategy development.

4.2.1 Technology Transfer

Technology may be "hard" or "soft," depending upon physical facilities, equipment, and remote sensing on the one hand, and institutional arrangements on the other. Technologies may be "high-tech" or, as is often the case in the Amazon, "middle-tech." Technology transfer occurs through direct inputs or replication, and these can be pooled, made available at a distance, or embedded in something else.

Some projects, like the USDA Forest Service (USDA/FS) contributions to the Fire Prevention and Control Program at IBAMA, provide fairly high-level technical inputs into government programs or institutions and, to a lesser extent, NGOs. As a result, IBAMA now has a more sophisticated fire monitoring system than that of the US. The risk map, the system's centerpiece, consists of sophisticated overlays originally developed by the Environmental Research Institute for the Amazon (IPAM). Science centers, such as the National Research Institute of the Amazon (INPA) and the Emilio Goeldi Museum of Pará (MPEG), received support for critical infrastructure needs from the G7 Pilot Program through its Science and Technology component.

Middle-level technology is transferred directly through initiatives that involve the various land use systems, such as agro-forestry, reduced-impact forest management, and management of protected areas and biological corridors; community-level socio-economic diagnostics; and ecological-economic zoning (ZEE).

Middle-level technology often requires adaptation. For example, although most agro-forestry systems are considered so[illegible] their appropriateness may not be clear—do these systems meet poor rural farmers' needs while making a net contribution to overall environmental quality? The Program has

used its experience with partners and sub-grantees to produce excellent studies to monitor, evaluate, and adjust agro-forestry systems that can be introduced elsewhere with success on both counts. Further, reduced-impact forest management, which is sound in principle, has successfully moved from experimental situations in favorable locations to becoming established in large-scale commercial operations in more remote areas.

Middle-level technology limitations appear as they are applied to new areas and new themes. Management plan development in the Serra do Divisor National Park used rapid ecological evaluation techniques to good advantage, but the method requires further refinement for on-the-ground monitoring use at the scale needed in the Amazon. Biological corridors, a well-established conservation model at smaller scales, also have promise at larger scales, as the Program has shown. Likewise, PESA technology,[13] which resembles rapid or participatory rural appraisal, has been useful at the community level, especially in Acre. The Fundaçâo Vitória Amazônica (FVA) and the Environmental Research Institute of the Amazon (IPAM) have also used participatory techniques to achieve a good understanding of local communities. The World Wide Fund for Nature (WWF) in Acre supports ecological-economic zoning exercises using geographical information systems (GIS) technologies that can serve as planning tools. Technical challenges, such as those surrounding efforts to combine natural and social data, biodiversity maps, appropriate scales, and implementation or enforcement mechanisms, are slowly being overcome.

Grantees or sub-grantees often induce technology replication (for example, the extension of Woods Hole Research Center work in the Capim River area to a neighboring community), and third parties also play a part in impromptu copying. Replication is often accomplished with funding from USAID/Brazil or other sources, and either can be considered Program impact if the idea originated or was refined with USAID support. Replication apart from direct Program effort is more difficult to trace and evaluate; agro-forestry systems (SAFs) occur as small experiments all over the Amazon, making it awkward to claim direct Program responsibility for their establishment. On the other hand, 18 companies have adopted reduced-impact forest management models that originated with the Program.

"Hard" technology can affect "soft" technology and vice versa. Computers offer basic, multiple, and long-lasting benefits, powerful tools, and access to the Internet, along with comparatively rapid and inexpensive communication. Program-funded infrastructure and equipment have facilitated unprecedented efforts in strategic planning and a commitment to applied research in major science centers. Brazil is eager to acquire advanced technology and adapt it to Brazilian conditions; for example, information technology will help overcome Amazonian distances. Dialogue with the Ministry of Science and Technology (MCT) attempts to increase funding for the North, Northeast

[13] Participatory Socio-environmental Research Methodology for Rural Areas.

and Center-West regions of Brazil, as well as for other scientific and technological institutions, such as the Brazilian Agricultural Research Enterprise (EMBRAPA) and the Oswaldo Cruz Foundation (FIOCRUZ). Although the Program has few formal links with the larger US technology programs in Brazil, informal links and synergy are high.[14]

4.2.2 Organizational Development

Organizational development's high and middle levels correspond respectively to government and to communities or NGOs. Through the activities of the WWF, the Program worked directly on organizational development in strategic planning, project design, budgeting, accounting, reporting, management, and fundraising. Technical support was provided for numerous local NGO and community Partners, as well as for the Amazon Working Group (GTA) as a whole. Examples of WWF's work with community-level groups include support for organizing a hearts of palm cooperative in Cajari and for support given to the Research and Extension in Agroforestry Systems Group – State of Acre's (PESACRE) effort to establish the *Novo Ideal* rural community association.

The 2000 evaluation report shows that WWF has scaled down its organizational development program, suggesting that the content of explicit organizational development efforts, which are based mainly on models designed for large organizations, may not yet be appropriate for the Brazilian context and for communities at the grassroots level. Thus, such models may become counterproductive without careful analysis of appropriateness. Further, their success involves a risk of promoting parallel structures that could isolate the environmental movement or splinter it into dissident groups.

On the other hand, higher-level organizational models involving public-private interfaces do hold promise for being adapted to local conditions. For example, The Nature Conservancy (TNC) is doing pioneer work on land trusts and easements for conservation on private land. Additionally, new organizational models have emerged from experience in the field. One of the most remarkable examples is community fire management, originally developed by the Woods Hole Research Center (WHRC) in the Del Rei community in Paragominas. This seminal idea, based on community participation and stakeholder negotiation, was later adopted and adapted by PROTEGER (the Fire Prevention, Mobilization and Training Project) after the fire emergency in Roraima in 1998, and by the Ministry of Environment and Friends of the Earth for their work on municipal fire protocols.

Another organizational model, which deserves further support, is that of civil society participation in environmental or sustainable development councils at the municipal, state, and federal levels.

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[14] These projects include the Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) —which has funding of US$80 million from NASA—and both the System of Amazon Surveillance (SIVAM) and the System of Amazon Protection (SIPAM), which involve a US company (Raytheon) and a loan of US$1.4 billion.

Various sub-grantees participate in such councils where they have voice and, in some cases, enough votes to influence outcomes. In time, the issues of representation, qualification, co-optation, cost recovery, and negotiation will be resolved. The same applies to participation in public hearings and licensing processes, where WHRC and IPAM have outstanding experience as both up-front and behind-the-scenes advisors.

Organizational development efforts have yet to realize their enormous potential to influence economic, social, and political structures that determine sustainability. Efforts at the community level can be stymied by socio-cultural differences within localities. At higher levels, however, involving government processes and relations between the public and private sectors, there appears to be greater and increasing potential for international cooperation. The Program can learn lessons from its experiences at the community and NGO levels, and these can be used at the higher levels so that the efforts can be more cost effective. It should be borne in mind, however, that the grassroots have been its primary clientele and are key to systemic changes.

4.2.3 Training and Human Resources

Formal and informal training and on-the-job experience clearly have large multiplier effects and reach far beyond any immediate target. Benefits continue to accumulate over time and become more effective as former trainees either move up in their organizations or move elsewhere. Training, accomplished through work with individuals as well as through institutions, helps increase awareness of the problems of forest and biodiversity loss and climate change and encourages use of this information in the course of normal activities. The Program conducted training activities for lawyers (including public attorneys) and journalists, who have systemic impacts in the legal structure as well as on public opinion.

Perhaps the most significant training efforts of the Program are being handled by the State University of New York (SUNY), the Smithsonian Institution (SI) and the Tropical Forest Foundation (TFF). Since 1990, the SUNY program, which was absorbed by the WWF/SUNY *Natureza e Sociedade* training program in 1997, has directly trained more than 1,000 people in individual or group programs of short, medium and long duration. Survey results from 1995 and 2000 show that former trainees later train an average of more than 100 others in one to three years; that these numbers increase over time; and that the training had high impact on research, community development, training, and policy. Trainees report that the Program "opens doors" and is important in helping them qualify for other programs, such as the Brazilian Leadership for Environment and Development (LEAD) program and graduate study. Outstanding former trainees include the attorney for IBAMA, the Coordinator of the National Environment Fund (FNMA), an analyst at the Environmental Investment Fund (A2R), a public attorney in the Federal District, the Technical Secretary for Natural Resources Policy of the PPG-7 Pilot Program, and the Secretary of Environment of Corumbá, who is also a leader among the forest police in Mato Grosso do Sul. Many of the high-level staff of the

Ministry of Environment and IBAMA were Program-sponsored trainees. Almost all of the Institute of Man and Amazon and the Environment (IMAZON) research staff have studied abroad with support from SUNY.

Former trainees identify with the Program and return to help out in other training efforts. They often form networks of mutual exchange and support, and they are important channels of communication between the Program and their own institutions.

Current programs include training courses in environmental policy, environmental communication, environmental law, and environmental economics, and participants include government authorities, public attorneys, journalists, NGO members, and representatives from the private sector. In the early 1990s, training normally took place in the U.S., but in-country training programs now drastically reduce costs, expand the pool of potential clients, and open the program to non-English speakers. An important characteristic of the SUNY program is its ability to make decisions based on the strategic relevance of the training and the trainee.

The Program has supported various kinds of fellowships for graduate-level scientific training and research. The Smithsonian Institution very early in the Program provided scientific field training through a course in tropical ecology and has now added courses for decision makers and for local university students, who often remain as interns. SI staff can teach at the University of Amazonas. Likewise, the research staffs from IMAZON and IPAM use trainees in their projects. Project participants also reach students in classroom settings and by advising theses, especially at the University of Florida, the Federal University of Acre, and the Federal University of Pará. The Tropical Forest Foundation has provided specific training in reduced-impact forest management and has plans to establish a training center.

In addition to training, on-the-job experience in NGOs helps prepare personnel for government, the private sector, and for work with the international agencies—all of which need human resources who know the region, have worked in the field, and have managed or administered environmental management projects. For example, former participants are, or have been, government authorities (a Secretary in the Ministry of Environment and the former President of IBAMA), Banco Axial staff, and World Bank staff, among others.

The Assessment Team concluded that the Program has exceeded expectations and still has great potential regarding training and human resources. Training individuals strategically supports institutional change without formal and costly inter-governmental agreements. It reaches far beyond targets, which are not isolated points, and offers a strong multiplier effect. Impacts are immediate, but also long lasting, and they increase over time. Training supports partners and influences powerful actors, such as government authorities, the legal and judicial system, civil society organizations, and mass media, and makes them allies of new causes. Former trainees interact with each other and the

Program and consolidate the results. For these reasons, training seems to be one of the best investments the USAID/Brazil Environment Program has made and can continue to make.

4.2.4 Information, Education, and Communication (IEC)

Dissemination of information means the diffusion of both scientific and popular information. IPAM, IMAZON, and the Smithsonian Institution have been responsible for the dissemination of scientific information with published articles appearing in journals like *Science* and *Nature*. There are also student theses, especially at the University of Florida. IMAZON has its own technical publication series. The IPAM experience was shown to millions of viewers on *Jornal Nacional* on November 28, 2000. The WWF and FVA Web sites offer excellent examples of new technology used for information dissemination.

WWF has an important national environmental education program and "SOS Amazônia" has worked in public schools in Acre. Such efforts contribute to the fact that the younger generations in Brazil have become more aware, as a matter of course, of causes, consequences, and linkages regarding environmental quality. However, relatively little has been done to reach the school system as a whole, from the elementary to university levels.

Information, education, and communication components of the Program are important because of their wide reach and their successful impact: the *Natureza Viv*a radio program reaches the entire Amazonian population; WWF provides program material for the *Globo* television network and frequently appears on its news and feature programs; dissemination through the printed media include articles in *Time* (mentioning WHRC) and in *Veja* (mentioning SI, IPAM, WHRC, IMAZON and WWF). IPAM projections of deforestation appeared in a major national newspaper (the *Folha de São Paulo).* NGOs and private-sector organizations, which command vast resources and welcome new material, have made significant contributions to the effort.

4.2.5 Advocacy

Policy advocacy can be conducted through position papers, NGO networks, campaigns, consultancies, public hearings, and by participating in licensing processes, among other things. IMAZON participated in the 1999 review of World Bank forest policy and PESACRE recommendations have been incorporated in state and regional planning processes. Policy actions that were of early interest to the Partners and grantees at the federal level include the National System of Conservation Units (SNUC) and the Environmental Crimes Law (LCA). At the state level, the WWF helped to get the Value-Added Tax (ICMS) approved in Mato Grosso.

Advocacy has emerged in recent years as a means to multiply impacts by several orders of magnitude. Where the Program is concerned, advocacy is carried out by local partners and requires alliances with non-partners and non-environmentalist groups, that is, by networking.

4.2.6 Networking

Although the USAID/Brazil Environment Program began as a group of isolated projects, networking within the Program has grown over time, particularly as a result of annual meetings. Likewise, the training of groups leads to networking among former trainees, who form a community, exchange ideas, and provide mutual support. Communication and cooperation within the Program has expanded.

Networking outside the Program has also grown. For example, IPAM is active in the Eastern Amazon Forum (FAOR), and it has organized regional and national meetings with the Brazil Sustainable and Democratic group, and in the inclusion of forests in the Clean Development Mechanism (CDM). The Fundação Vitória Amazônica (FVA) is active in the Permanent Forum for Debates on the Amazon (FORAM), the Amazon Working Group (GTA), the Brazilian NGO Forum, and the Agenda 21 Committee on Sustainable Development (CDSA21).

However, other NGOs—namely the Socio-environmental Institute (ISA), the Federation of Organizations for social and Educational assistance (FASE), the Brazilian Institute for Social Analysis (IBASE), Poverty and Environment in Amazonia (POEMA), Friends of the Earth, Greenpeace, Environmental Defense (ED) and the National Rubber Tappers Council (CNS)—are not as active in the Program as they could be. The powerful Atlantic Forest Network (RMA) is not active in the Program, and the Amazon Working Group (GTA), with its hundreds of member organizations all over the Amazon, does not participate as a full partner. Additionally, labor organizations such as the Federation of Agricultural Workers (FETAGRI), in particular the state-level organization in Pará, and the National Confederation of Rural Workers (CONTAG), which includes small farmers, might benefit from being associated with the Program. Likewise, contact with business associations such as state federations or National Confederations of Agriculture (CNA) or Industry (CNI) and private sector organizations, which represent the large farmers, ranchers and loggers, could also be profitably engaged.

Although some of the grantees are themselves international networks (WWF, TNC and CI), and at least one of the sub-grantees is essentially a network (PESACRE), further networking among projects or Partners may be advantageous. Relatively spontaneous networking has occurred and has helped reach beyond target areas, but how institutionalized the networking should become depends on specific issues and circumstances. As one Partner put it, the networks are like "megaphones" that make government and business listen to otherwise isolated voices.

4.3 Assessment

Of the six mechanisms analyzed above, training's vast and traceable impact continues to grow. The impacts of IEC and advocacy have enormous potential and should probably be conducted more deliberately rather than being left to each project to do in isolation and in its own way.

The Program appears to contribute most directly to biodiversity conservation in the Atlantic Forest, which faces immediate threats of species and ecosystem extinction. In the Amazon, the Program contributes to biodiversity conservation in the long run, since protected areas, such as Serra do Divisor and Jaú, are currently under little pressure.

Contributions to biodiversity conservation in both these biomes generally depend on direct conservation efforts involving protected areas. Promotion of alternative land uses has not been as successful; agro-forestry systems are essentially experimental and have yet to be proven as a viable alternative over the long term. Reduced-impact forest management, however, has been shown to be better than conventional logging, as reflected by an increasing number of operations being certified according to Forest Stewardship Council (FSC) standards, but requires dissemination to ensure its continued adoption in the Amazon.

The Program offers possibilities for a reduction of Brazil's carbon emissions through the control of fire over thousands of square kilometers. Although this activity was not foreseen in the original Global Climate Change (GCC) Program design, a large reduction in accidental fires between 1999 and 2000 occurred because of the Program's explicit and direct monitoring and control efforts.

An ecosystem approach to planning, which includes attention to biodiversity conservation and integrated management of the hydrological regime, would also be in the national interest. The Program has focused most of its efforts on biodiversity conservation and carbon sequestration. Some partners have extended their work to water resources management (Conservation International has worked in the Pantanal wetlands and IPAM has worked with hydrological cycles in the Amazon). However, partners have not explored extensively the interrelations among water, biodiversity, and carbon sequestration. This, as well as issues surrounding international waters, desertification, and work with the private sector, may be the major gaps that the future strategy must address.

5. USAID/Brazil's Comparative Advantage

Because of its unique history, USAID/Brazil has enjoyed relative freedom in the allocation of its resources and has exercised this freedom in funding a talented, committed and successful set of partners and projects, which has allowed a wide range of interests to be included in the Mission's "family." This is but one of the many comparative advantages and special strengths of USAID/Brazil that should be considered in the overall context of Brazilian society and to the overall panorama of other donors and their interests, experience, and expertise. If the Mission has a clear sense of these comparative advantages, the more consciously and strategically it can position itself within these contexts, communicate this focus to its community of partners, and receive proposals that share this focus.

The following are the comparative advantages heard most frequently from USAID/Brazil partners:

5.1 The Importance of Integration of Conservation and Development

Major international donors have contributed generous funding for several areas, including biodiversity assessment, large-scale physical/chemical/climatological research (satellite imaging, mapping, carbon storage and flux, etc.), as well as the purchase and protection of land for conservation units. While these are important areas of research and conservation, USAID's Program stands out in recognizing that secure, long-term biodiversity conservation and deforestation reduction depend on the participation and support of the Brazilian people and that successful conservation and development require interdependent activities. When these facts are ignored, Brazilians can perceive biodiversity and forest conservation as a negative agenda, fueled by 'eco-imperialism.' When public participation and interdependence are resepcted, however, conservation can gain its necessary constituency.

5.2 Long-term Interest and Experience in Working with Civil Society

USAID/Brazil's support for NGOs began partly as a consequence of the absence of a bilateral accord with the Government of Brazil. This is a particularly fruitful association, because it is precisely among the environmental NGOs that the relationships between societies and their environments are now being understood. NGOs in Brazil now play seminal roles, together with the press and other media, in the transition from the institutional and cultural habits of years of military government towards a truly participatory democracy. NGOs are among the most organized groups in civil society and have working relations with a range of other civil organizations. They also have flexible positioning *vis a vis* the federal ministries and private corporations. While NGOs have been essentially outside the official structure and, therefore, able to observe and critique the actions of the

most powerful of groups, the versatile composition of their staffs (drawn from and maintaining contacts with academia, government and the private sector) allows them to contribute to their own growing awareness of ecological and social realities.

5.3 Working with Communities and Long-term Projects

Site-based sustainable development projects include those which have worked with associations of producers (e.g., projects in agro-forestry and organic production of PESACRE in Acre, of IPAM in Pará, and of the Institute for Social and Environmental Studies of Southern Bahia [IESB]); with municipalities as communities with common concerns (e.g., PROTEGER fire prevention); in ecotourism (IESB); in areas adjacent to protected areas (FVA) and in biological corridors (CI in the Atlantic Forest, Cerrado, and Pantanal). In each case, attention is focused on local realities and social contexts and on ways local actors can help find solutions. USAID/Brazil's Mission's partners have learned that a project can achieve greater impact if it works with already existing local social organizations.

The Mission's NGO partners have worked successfully with local community organizations in rural areas, including trade unions, cooperatives, associations, and church groups. This has been strategically effective, since pre-existing local organizations facilitate land tenure rights and credit, both of which are necessary to develop alternative production strategies. These organizations also provide built-in networks to disseminate promising production practices and offer economies of scale for the processing, transportation, and commercialization of products. NGOs at national and regional levels have recognized the advantages of working with community organizations and modified their approaches to maximize collaboration with them. Participatory research approaches have become standard practice for several NGOs (e.g., PESACRE, IPAM, IESB). When combined with a long-term working relationship with community organizations, these approaches provide a number of benefits, like incorporation of social realities in the agenda of researchers in agro-ecology; greater trust and credibility regarding NGO knowledge, and, therefore, greater willingness to incorporate insights and elements of practice; and empowerment of producers as fellow researchers.

This attention to local, on-the-ground realities gives the Mission's partners a comparative advantage in attending to the potential gaps between rhetoric/laws/rules and Program goals, on the one hand, and actual on-the-ground practices and impacts, on the other.

5.4 Flexibility, Creativity, Responsiveness, and Mobilization

The Mission's ability to respond to events rapidly and creatively comes from its own rich network of contacts in all sectors, both in Brazil and the U.S.; from the absence of onerous bureaucratic requirements; and from its long-term support for Brazilian NGOs, who enjoy a certain autonomy of action and resourceful membership with cross-cutting contacts and lateral links. This rapid, creative

mobilization was revealed most successfully in response to the massive outbreaks of fires in the Amazon in 1998 in the form of USAID/Brazil funding of GTA and in its project PROTEGER.

PROTEGER's content was inspired by IPAM's work in the Del Rei community in Paragominas. Working on an agro-forestry project, staff soon learned from conversations with farmers of the critical problem of accidental fires. In response, they developed a participatory approach to fire prevention and combat based on community meetings, diagnostics, negotiation, and grassroots consensus building. For its structure, PROTEGER utilized the GTA, a network of some 400 community organizations in the Amazon. Using both the community techniques in fire-prevention and fire fighting and the community participatory approach learned by IPAM, PROTEGER was considered quite effective. New projects under the Pilot Program to Conserve the Brazilian Rain Forest often take years to negotiate, as they depend on the complex bureaucracies of governments, international funding institutions, and other bilateral donors. USAID/Brazil Mission's flexibility and contacts allowed channeling funds to PROTEGER in a remarkably short time.

5.5 Experience in Implementing Education, Training, and Capacity-Building Projects

Contributing to the Program's success is that some projects deal directly with environmental problems and others help build a critical mass of people and institutions with a range of cross-cutting abilities (e.g., scientific, managerial, and fiscal). This advantage clearly relates both to the Mission's recognition of the critical role of people in meeting global environmental challenges and to its flexible engagement and articulation with all sectors of society. Mission-supported projects have covered a wide range of topics and clientele (see box).

Mission-Supported Projects

Environmental education in public elementary schools—Manaus, Belém, Santarém and Marabá

Master's and doctorate research— SUNY and WWF

Mid-career professional training in various fields:

- Private and public land managers—TFF's 14 courses in reduced-impact logging
- Civil service personnel in several ministries—University of Florida (UF)/PESACRE/University of Acre's courses in both agro-forestry and the methodology of participatory research
- Researchers and managers of forest biodiversity—Smithsonian/Organization for Tropical Studies (OTS) courses in Forest Ecology
- NGO managers—WWF's courses and workshops in organizational development, including fund-raising, bookkeeping, and conflict management

A common element in the most successful of these programs is that they tap the expertise and interests of a number of social sectors, including government ministries, businesses, academia, pre-university education, and rural producers and land-managers.

5.6 Successful Operation at Many Scales

Many partners indicate an increasing interest in working at a larger scale, beyond the site-based pilot project and towards impacts on commercialization, legislation, education at various levels, the private sector, and the media. Two main concerns influence any scale-of-effort increase while maintaining the best aspects of a site-based, community-level, pilot-project tradition. One regards incorporating sustainable development models based on local NGO pilot projects into government programs and incorporating sustainable development practices into large-scale private sector efforts. The other concern is that, while government programs receive funding critical for replicating models at the scale of a state or even the nation, on-the-ground monitoring will require attention. For example, powerful interests (government, NGO, commercial, and consumer) want forest production method certification to proceed rapidly. USAID/Brazil partners have the skills, resources, and neutrality to certify and monitor the production practices on a broader scale.

6. Recommendations

6.1 Rationale and Framework for Discussion

This report represents an early stage in the effort to build a sound strategy to guide USAID/Brazil's Environment Program between 2003 and 2007. The assessment reviewed the Program's impacts and offers a description of selected gaps and opportunities for USAID/Brazil to consider as it continues to evolve its strategy.

Several strategic recommendations consider the current context of the Brazilian economy, government, and society and on the global need to reduce biodiversity loss and slow climate change. These recommendations reflect USAID/Brazil's experience and comparative advantages and are based on recognition of the specific differences among Brazil's major biomes, the environmental services they provide, and the major threats to their integrity. The recommendations fall into three broad sets—thematic, geographic, and structural—and build on the Environment Program's current strengths, extend them into other areas of critical need, and look to improve the Program's already strong coherence and efficacy.

6.1.1 Program Successes

The Program has done an excellent job in fulfilling its mandates to work on the global issues of biodiversity conservation and the mitigation of global climate change. The partnership model seems to work well and appears cost effective.

The Program has used these successes to work on some of Brazil's more important social and economic issues. For example it has slowed unwanted migration while strengthening settlements, reduced fire losses, disseminated valuable forest management practices, and improved natural resource management policy. In addition, the Program has trained experts and lay people in environmental management, and activities have generated a "ripple effect" so that the Program's products are now used or accepted outside of the original target areas.

6.1.2 Gaps and Opportunities

Several gaps and opportunities for future strategy development were identified and converted into a series of thematic, geographical, and programmatic recommendations. Although the Team did not perform an analysis to set priorities on these recommendations, selected suggestions may help to set priorities.

Thematic recommendations. The current priority could remain fulfillment of Agency Objective 5.1 ("Threat of global climate change reduced") and Agency Objective 5.2 ("Biological diversity conserved"). However, work on alleviating desertification and the problems created by different demands on international waters (e.g., Hydrovia watershed) and their catchments are important and justified.

Institutional memory of the procedures and history of the USAID/Brazil Environment Program should be maintained. No "graduation" of Partners or grantees is called for at this time.

USAID should engage the private sector. Brazil's development will continue to pursue economic growth, and the private sector will increase in importance. Examples of opportunities include the following:

- Developing conservation corridors and private conservation areas, with less emphasis on establishing new national parks.

- Engaging the private sector in best practices for forestry and ranching, with less emphasis on the establishing and consolidating settlements, except perhaps developing produce markets for already established settlements.

- Disseminating reduced-impact logging practices, with more effort spent on training and extension and less on research.

- Extending the sustainable forest management best practices, including reduced impact logging and training.

Geographic recommendations. The Amazon remains a high priority because it supports USAID's Environment Program in biodiversity (AO 5.1) and GCC (AO 5.2). A geographic priority would be as follows: 1) Amazon, 2) Cerrado, 3) Patanal, 4) Caatinga, and 5) Atlantic Forest.

Programmatic recommendations. The different problems of environmental quality facing Brazil call for different strategies. Both the Amazon and Cerrado biomes must be developed according to sustainable land use practices that conserve the regions' natural resources. The extensive, long-term challenges to protect and develop these ecosystems require a delicate balance between the demands and pressures of local poverty, a global economy, and the conservation of tropical forests.

Special strategies need to be developed to meet the conservation objectives and protect the rights of individuals. In the Caatinga, methods must be developed to interrupt the advance of deserts and meet the needs of the poorest of the population. Further, only a low percentage of the territory is conserved, sustainable land use strategies must be promoted among private landholders to make

them active participants so that the objectives of both conservation and development are met, and the fruits of the effort are well distributed.

When the Program was working primarily with community-level demonstration projects, it was appropriate for it to consider impacts beyond target areas. However, in the case of public policy and other areas, targets have become broader and should be institutionalized so that target areas are not isolated points, but rather more systemic objectives. Evidence shows that the Program can influence millions of people over many square kilometers and leverage the use of billions of dollars at the national level. At the same time, community-level work should not be abandoned—advocacy and dissemination can be done best if the Program keeps its feet on the ground and works locally, as well.

6.2 Thematic Recommendations

6.2.1 Support Intensification of Agricultural Production

Much of the Amazon's forest degradation can be attributed to the dynamics of extensive land-use that increases areas with low productivity by destroying mature forest. The most important efforts to protect wildland areas and their particularly rich biodiversity, therefore, involve maximizing land-use intensification in areas that have already suffered forest degradation. Such techniques are available and include the insights, crops, and trees of traditional indigenous and *cabolco* land-use, as well as insights and methods derived from scientific research. Still, four major activities could require greater attention on the part of the Mission:

The incorporation of more field crops and livestock into agro-forestry. Field crops and livestock are integral parts of production strategies of the many rural households along the edge of the mature forests. Additionally, there is a strong cultural and economic tilt towards cattle raising by both small and large landholders. Given the large areas of the Amazon in degraded pasture, a critical need exists for research and extension to incorporate additional crops and livestock in management schemes throughout areas that are being degraded.

A reduction of the spread of accidental fires and the use of fire as a management tool. Fire remains the least expensive and fastest way to clear land, to control weeds, and to give a nutrient boost to soils. Since the practice will not be abandoned as a management tool in the foreseeable future, a number of research projects to reduce the accidental escape of fire as well as to use fire correctly are underway and require further validation and extension. The Mission and its Partners could help to organize and fund these efforts.

Facilitation of land tenure security. Insecure land tenure also encourages deforestation. Unclear plot boundaries, contradictory and fraudulent titles, distant bureaucratic mazes, and naked

intimidation have forced families to move on to "new" areas. Without security of tenure, producers simply have no reason to be concerned about a piece of land's future productive capacity. Many rural associations and cooperatives began as community organizations in the struggle to secure land rights, and Program partners assisted in these efforts. Capacity building in cadastral surveys and land tenure law, as well as practical training to facilitate movement through the various bureaucratic mazes, could help frontier families gain secure land title.

Reinforcement of extension services. USAID/Brazil's partners most frequently express the critical need for extension services. Despite the last decade's changes in production basis along with the realities and challenges of smallholder production, the Amazon has only two percent of the country's scientists. Moreover, EMBRATER, the federal agricultural extension agency, has been dismantled, and research needs a new orientation. On a positive note, the Ministry of Science and Technology has invited civil society to present its research priorities, and partners should take this invitation seriously. The Mission should encourage research decentralization and help make findings more broadly accessible, disseminating them beyond in-house reports and academic journals.

6.2.2 Facilitate Incentives for Sustainable Production and for the Development of Commercialization Chains

Several programs offer incentives in the form of subsidies for sustainable production (rubber production, agroforestry) from governments and NGOs. Sustainable production deserves targeted incentives at least for the short and mid-term. For example, most of the rural producers depend on market sales-generated cash. Often, sustainable techniques require up-front investments to generate returns in the future, e.g., planting trees and nitrogen-fixing cover crops, composting, stall-fed livestock, and systematic manure application.

Several parts of the Mission's Program could support viable commercialization chains. In addition to having access to U.S. expertise in processing technology, sanitation, quality control, market analysis, business planning, and advertising, the Mission could do the following:

Support credit and investment for rural families. Sustainable production systems often require greater labor per unit area than non-sustainable systems. Both public and private lenders indicate growing interest in providing credit to projects and small producers for sustainable development. However, if credit is not linked to effective extension, efficient marketing systems, and independent monitoring of production practices, it will only increase smallholder debt, leading to eventual foreclosures, further concentration of land in the hands of large landholders, and further expansion of extensive land-use practices.

Support efforts to improve settlement projects. A similar recommendation is to support present and future settlement projects. Despite years of disappointing results regarding planned settlement,

a strong interest among both the rural and urban poor for such projects remains. Present and future settlement projects must learn from past mistakes, and EMBRAPA-Acre is now training staff from the National Institute of Resettlement and Agrarian Reform (INCRA) in other states of the Amazon to include more complete analysis in the selection of sites and settlers and to provide appropriate extension services. The Mission should support programs to link settlement projects with extension in sustainable production practices and in commercialization strategies.

6.2.3 Build Bridges to Link Urban and Rural Environmental Management Priorities

Public opinion between northern and southern Brazil differs in that the South expresses strong ideas concerning conservation and protection of the Amazon, while the North expresses values favoring maximum economic and employment benefits from development of the Amazon. The Mission should work to develop links between these different priorities because any successful effort to conserve the Amazon Basin must have the support of a critical mass of the Brazilian society, government, and business community. Further, foreign-funded efforts cannot be perceived as running counter to Brazilian priorities.

Given the overwhelmingly urban nature of the Brazilian society, priorities should link efforts to reduce deforestation with efforts to increase employment and economic security in urban areas. Four potential bridges offer promise:

- Develop industries in regional mid-size cities to process and package rural products for regional, national and international markets;

- Increase benefits to regional mid-size cities from ecotourism and research on biodiversity and global climate change;

- Increase the variety and marketing of goods produced in a region's rural areas to its urban consumers; and

- Improve access to clean water for urban consumption via watershed protection.

6.2.4 Build Bridges between Technology and Good Governance

Brazil has a rigorous body of environmental regulations although little is known about their effectiveness. USAID/Brazil has a comparative advantage in combining technology with good governance, and a valuable example of this is SIVAM—the satellite-based system that will soon monitor a variety of useful parameters for enforcing environmental regulations. Originally conceived to monitor and control potential military threats over vast areas, it now will be used to monitor and evaluate natural resources, analyze environmental damage, and support planning activities.

6.2.5 Increase Efforts to Certify Forest Operations and Establish Effective Production Forests

The lack of effective governmental monitoring and enforcement regarding logging operations creates incentives for illegal activities and adversely affects deforestation dynamics. National and international support is growing for the view that independent certification of production forestry could help mitigate deforestation and even strengthen forest conservation through improved production systems. Many Brazilian timber buyers and forest products manufacturers agree, and Brazil is actively developing national forest certification standards within the FSC framework to help improve forest management sustainability. Brazil's large domestic market consumes 86 percent of Amazon timber production, leaving only a modest export market for Brazilian forest products. Therefore, promotion of certified timber should concentrate on the Brazilian urban population.

The Mission, in collaboration with the Tropical Forest Foundation and the USDA Forest Service, WWF, and IMAZON, has made significant contributions toward improving the quality of production-oriented forest management, mainly through training and demonstration efforts focusing on reduced-impact harvesting. While a certification process involves a number of principles and criteria covering ecological, social, and economic aspects of forest management, controlling the environmental impacts of logging is an essential component of the process. This is particularly true in natural tropical forests, where most of the damage is caused by the activities of the logging operation itself (e.g., poor road and skid trail construction, over-cutting, careless felling and skidding).

The Mission should continue to support research, demonstration, and training on reduced-impact harvesting, build on the experience gained over the past several years, and continue to assist in developing the planning tools and harvesting standards to include in certification programs for the natural forests of Brazil. Additionally, based on its experience in community-based forest management, (e.g., through the Paragominas Project) the Mission can also assist in developing technical standards for the certification of small producers under the "Group Certification" concept.

6.2.6 Engage the Private Sector

One of the few weaknesses of the approach taken by the Program and its partners is that their focus on smallholder production challenges has meant a lack of engagement with the economically powerful in both rural and urban areas. The private sector can be a critically important ally to conservation and to the other aspects of sustainable development.[15] Vast tracts of land throughout Brazil are in the hands of private citizens and corporations that can affect land-use directly through

[15] Appendix 7 contains a matrix describing a number of private sector environmental actions.

their own land-use decisions, and indirectly, through their participation in, or resistance to, projects to settle such areas. Many of the largest landowners are also connected to regional industries and commercial centers. Consequently, their cooperation is critical to efforts to conserve biodiversity, reduce the threat of global climate change, and market sustainably produced goods from both large and small producers. Given the critical shortage of capital, equipment, and managerial and entrepreneurial expertise in much of the rural North, their participation in sustainable development is an absolute necessity.

Many of the economically powerful elite in the North's rural areas also dominate municipal and state governments. As such, their attitudes towards settlement programs, environmental regulations and enforcement, and large-scale development projects are critically important. The elite are more likely to support conservation and resources management efforts if they see greater economic and other benefits for their own enterprises as a result. The Mission should support projects that increase the possibilities for mutual benefit: 1) the private sector can be appealed to for donations to support NGOs or to support the purchase of protected areas; 2) it can be appealed to for political support of conservation initiatives or to resist environmentally destructive projects; and 3) it can be made aware of the close relationship between high rates of material consumption and environmental degradation.

Likewise, the private sector can sponsor projects and participate as a research partner in the study and analysis of production–distribution systems and as an incubator of sustainable and socially aware enterprises. The private sector can also be a patron of environmental campaigns and link itself to environmental causes. Finally, it can provide expertise in a variety of established areas of knowledge, and it can co-promote sustainably-produced goods, certification, and labeling.

The Mission and its partners should acknowledge that the large economic development projects are related to national integration and imply that the region will be both settled and economically linked with the rest of the country and the world with the inevitable participation of the private sector. Sustainable production systems in forestry, agriculture, livestock, and fisheries should be presented to the most powerful economic and political actors and to the general public as viable and supportive means to these ends.

6.2.7 Monitor Major Infrastructure Projects That Can Bring About Significant Environmental Change

Despite Brazil's many conservation and sustainable development projects implemented over the past decades, the future of biodiversity and carbon sequestration may ultimately depend on how plans for large economic development projects materialize. Campaigns against such projects would be unwise without the existence of convincing, substantive, realistic, and attractive alternative development models. Thus, efforts should not only assist the spread of good practices, but also entail evaluation

of their environmental, economic, and social impacts, along with wide dissemination of evaluation findings.

6.2.8 Improve Monitoring of Best Practices and Sustainable Production Systems

Quantitative data on sustainable production systems supported by the Program and its partners should be systematically gathered. For instance, Acre lacks records of yields or income in the five agro-forestry communities visited. First, the collection of actual yields and incomes by area and product, as well as ongoing impacts on a range of ecosystem and social variables, is essential—scientists and NGOs require such data to identify weak links in these systems and to guide further research and project design. Second, NGOs, extension agents, and producers need information about particularly successful production systems so that they can make recommendations to other stakeholders. For example, considerable progress has been made in the collection and organization of quantitative forest management information. Third, data will be required by any attempt to certify or label a product as sustainably produced.

6.3 Geographic Recommendations

With some notable exceptions, international donors over the last ten to 15 years have focused their environmental programs on the problems and potential of the forests of the Amazon Basin. Recently, however, many NGOs and governments have seen that other biomes in Brazil are equally important for meeting the goals and objectives of a globally relevant environmental program. The Assessment Team, therefore, offers the following recommendations for consideration by the USAID/Brazil Environment Program:

6.3.1 The Program Should Maintain Its Primary Focus in the Amazon

The size of the region, its importance for biodiversity conservation, and for slowing climate change, together with the continuing public and private efforts to mount major infrastructure and agriculture projects in the region, all argue that this focus be maintained. Furthermore, several of the Mission's comparative advantages have special importance in the Amazon Basin because of the differences between formal law and actual practice and the need for exchanging ideas in promoting technology transfer based on applied research results. Additionally, differences in opinion on environmental issues between the urban majority and the rural minority, as well as between the country's northern and southern regions, require the Mission and its Partners to help integrate social and environmental concerns and processes. The Mission and its partners have extensive experience with community organizations and their broadly based staffs and contacts with scientists, government officials, ranchers, loggers, and small farmers—all of which argue for maintenance of the Amazon portion of the Program.

6.3.2 The Program Should Begin Work in Other Important Biomes of Brazil

Brazil has vast natural ecosystems in addition to the Amazon, and two of them, the Cerrado and the Atlantic Forest, are among the 25 most threatened ecosystems in the world. Further, the Pantanal lays claim to being the earth's largest wetland system, and the Caatinga is Brazil's focal point in the international effort to halt desertification. USAID/Brazil Environment Program's reasons to strengthen its activities in these biomes include the need to reinforce the few underfunded and understaffed efforts now underway in these areas and to take advantage of the new, relevant lessons that can be learned by working in these places. Comparative advantages of the Mission for work in all of these biomes include its experience with local groups, producers, scientists, and extensionists; its ability to leverage funding from other sources; and its contacts in the US and Brazilian academia, government, and the private sector. In priority order, entry is recommended in the Cerrado, the Pantanal, the Caatinga, and the Atlantic Forest.

- **The Cerrado**. In Brazil, the Cerrado is second only to the Amazon forest in terms of its contribution to the two global environmental services identified as the current Agency Objectives (i.e., threat of global climate change reduced and biodiversity conserved). In addition, over 90 percent of Brazilians get a portion of their electrical energy from waters that drain from this biome, and irrigated agriculture has become an important, if conflictive, alternative use for the lands and waters of the Cerrado.

  Of the Mission's current partners, Conservation International has been working to develop a biological corridor to connect the Cerrado with the Pantanal and, eventually, with the Caatinga in Tocantins. Several strategies used by other of the partners in the Amazon would be appropriate in the Cerrado, for example, efforts to reduce the rate of land conversion by stabilization of existing producers, intensification of sustainable production systems, and lowering the rate and extent of accidental fires.

  Further, the critical needs in this biome would allow the Mission to move in important but relatively undeveloped directions. For instance, the development of agricultural systems that require less water, less pesticides and fertilizers, and maintain more groundcover, would help to stem the degradation and depletion of aquatic diversity and other freshwater resources.

- **Pantanal.** The Pantanal, another unique biome rich in biodiversity, is threatened by planned and existing infrastructure projects. Its biomass is enormous and includes that held beneath the waters. The carbon sequestration capacity of this system and its biodiversity are threatened by drainage, polders, and canals, which would dry out large areas if built. As mentioned in section two, the Pantanal also provides other critical environmental services of international scale, primarily the control of water flows through the Paraguay and Paraná river systems.

The land ownership pattern is quite different from that of the Amazon, although similar to that elsewhere in Brazil. It is almost entirely private and has only two officially recognized conservation units. Over much of the biome, private, deeded land of moderate size ranches has been held in the same families for generations. For conservation to claim a significant place and help meet the Environment Program's overall objectives, it must move outside the gates of the protected areas and convince private landowners of its value. The landowners in the Pantanal may be more amenable to adopting conservation practices. Approaches developed while working there (e.g., conservation easements) could be a stepping-stone to working with private landowners elsewhere.

- **Caatinga.** The Caatinga is home to some 20,000 species of plants, many of them endemic to this biome. While its contribution to climate change amelioration is less than that of the Amazon forests or the Cerrado, its living biomass is also increasingly threatened by land clearing. Not unrelated to this high level of land clearing is the fact that the Caatinga has the most polarized landholding system in all of rural Brazil, comprising *latifundios* and *minifundios* with little in between. This land ownership structure creates the social conditions which, together with the arid characteristics of the biome, lay a base for its increased desertification.

  With only one-third of the average annual rainfall of the Cerrado, the Caatinga suffers severe droughts, and these seem to have increased in both length and frequency. As a result, in the past 15 years, some 40,000 km^2 of the Caatinga have become increasingly desertified, threatening efforts to conserve its biodiversity and to improve social justice.

  The October 2000 U.S. Senate ratification of the International Convention for the Control of Desertification, along with substantial experience of U.S. institutions (including USAID) in the evaluation and remediation of aridity, favor the Mission's movement into this biome. Worthwhile efforts would include testing and extension of agricultural production and household systems that use minimal amounts of water; techniques to reduce evaporation from irrigation projects; and the development of agro-silvo-pastoral systems that incorporate native trees, improved pasture, and adapted perennial crops. Support to integrated water resource planning would also be of value given plans to divert major rivers into the biome.

- **Atlantic Forest.** The Atlantic Forest has the smallest remaining portion of its original area, and its value and vulnerability is receiving much local attention. The biome enjoys proximity to the greatest concentrations of highly educated people, scientific institutions, and media, and it receives the most intense pressure from urbanization. Despite its greatly reduced size, its biodiversity is enormous and globally significant. Conservation International's strategy to preserve this biodiversity focuses on 'connectivity' among the scattered remnants of forest through working with private landowners. Landowners must sign a legal agreement

prohibiting land uses other than conservation (which includes ecotourism) in these areas for perpetuity. In return, IBAMA promises to provide personnel to monitor and protect these properties, although it has not done so.

Thus, there are several critical needs: research on a range of potentially sustainable land-uses and their impacts; the development of the highest possible standards for any enterprise to be labeled ecotourism, and the development of local capability for consistent monitoring of these enterprises and their actual impacts.

6.4 Programmatic Recommendations

In general, the USAID/Brazil Environment Program and its implementation by the Mission and its partners has been widely successful. Many of the recommendations in this section may go against the rule that says, "If it ain't broke, don't fix it." Nevertheless, the Assessment Team did become aware of a few areas of the Program and its execution that could be improved with slight adjustments.

6.4.1 Request Proposals from the Partners

The Mission might consider presenting calls for proposals to the NGO community on themes that support its strategic goals, such as fire, sustainable land use, protected area management, and sustainable forest management. Such a competitive process would give the Mission greater control in shaping its program strategies and in influencing the projects and programs of its partners.

6.4.2 Support Critical Cross-Cutting Programs

To improve both the coherence and the effectiveness of the Program, the Team suggests that the Mission build on its experience with cross-cutting programs (e.g., capacity-building of *Natureza e Sociedade*) in the following directions:

- **Capacity building for NGOs and local communities.** Although the citizens of Brazil are sympathetic to environmental and social causes, private funds donated to NGOs are still not a common practice, and the majority of local community organizations have limited resources. Therefore, the Mission should continue to fund capacity-building programs. These should improve institutional and individual skills and should include training in strategic planning, accounting, report preparation, fund raising, conflict management, networking, evaluations, and extension methods.

- **Independent project monitoring.** The Mission has several important reasons to evaluate the Program's impact independently. The impartial collection of quantitative data should be

an integral part of every sustainable development and conservation project. These data should include information on biodiversity, soil analysis, tree cover, biomass, economic yields, prices, and gross and net incomes for individual producers and groups. Social variables, such as length of residence, continuity of settlement, conflicts and their solution, and the kind and amount of participation by the younger generation should also be looked at.

Two recommendations concerning independent monitoring include: 1) the Mission should offer workshops for all partners in monitoring methods to include simple mapping and record keeping (e.g., work diaries, yields, costs of inputs, and gross and net income); and 2) the Mission could fund a particular NGO whose sole responsibility would be to monitor the impacts of grantees' projects.

- **Dissemination of information.** All Mission projects should have clear mechanisms for 1) internal communication regarding problems, strategies, and coordination among partners; and 2) dissemination of achievements and lessons learned to broader audiences. These mechanisms should consider the validation and systematization of data, the identification of the various key audiences, and the most appropriate means to reach them, including training and materials. Successful dissemination mechanisms, usually defined by concrete situations rather than generically, focus on specific themes and audiences, such as manuals on specific practices or targeted workshops.

6.4.3 Adjustments to the Agency Objectives (AO) of the SO1 Framework

The two agency objectives currently being used (AO 5.1 "Threat of global climate change reduced," and AO 5.2 " Biological diversity conserved") have guided the Environment Program for USAID/Brazil since the mid-1990s. Though certainly still needed, the changing context may also suggest that additional objectives could be added with no real loss of focus:

- **Desertification.** The addition of an objective regarding the evaluation and control of desertification is recommended. In October 2000, the U.S. Senate ratified the International Convention to Combat Desertification, because the problem of increasing desertification is recognized as global. Significant opportunities exist for cross-fertilization that could help the U.S. solve its own desertification problems as well as those of Brazil. Support can come from U.S. universities in the Southwest that have substantial installed capacity to work on the problem (e.g., University of Arizona, Texas Tech University, University of New Mexico).

- **Other environmental security issues.** An objective regarding the mitigation of security threats from conflicts concerning international water should also be added.[16] The U.S. has demonstrated its interest in international waters through its participation in the Global Environment Facility and through ongoing studies of "environmental security." Further, it has shown its understanding of the security issues of international waters through treaties with its neighbors that regulate international waters shared with Canada and Mexico. Work on the questions of environmental security and international waters is relevant in the upper reaches of the Amazon Basin, the Pantanal, and the Paraguay/Paraná River System (e.g., Hydrovia). Support can come from U.S. universities and the United States Geological Survey (USGS), which have considerable experience in modeling hydrologic systems, and U.S. NGOs with experience in the establishment and management of Peace Parks.

6.4.4 Adjustment to the Strategic Goal of the SO1 Results Framework

The Strategic Goal of the SO1 Framework requires some adjustment to explicitly reflect the Environment Program's current interest or emphasis in climate change. As it is now, the goal specifically recognizes the biodiversity protection objective of USAID (AO 5.2) but not the climate change objective (AO 5.1).[17] A clear objective to orient work on desertification and international waters should also be specifically included in the Goal of the SO1 Results Framework. Work on both desertification and international waters could be justified on the basis of climate change and biodiversity objectives. However, they may also be justified on the basis of their own "global" importance, as indicated in the U.S. ratification of the "Desertification Treaty" and the interest of the U.S. Government in "international environmental security." If these adjustments are made, the changes should also be expressed more explicitly in the relevant Performance Indicators, most particularly in community preparedness. Other recommendations concerning Performance Indicators are to separate "indigenous reserves" from conservation units, and to rethink the use of "numbers of individuals reached" as being a representative indicator, since the figures are somewhat artificial and susceptible to inflation.

Likewise a clarification needs to be made on "sound land use systems." The use of the terms "sustainable" and "environmentally sound" do not accomplish such clarification unless these terms themselves are defined—not an easy task. Finally, while attempting to ensure success in the short run, the new framework should also consider the middle- and long-term impacts.

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[16] Other issues are potential flows of refugees moving from the upper to the lower Amazon resulting from narco-traffic activities, and clandestine cross-border exploitation of timber and fauna.

[17] The Goal states: "Rate of deforestation and land conversion reduced while maximizing biodiversity conservation," and does not specifically mention "climate change." (R4 SO1 Results Base Framework: Environment). Deforestation and land conversion could be interpreted as being important for their influence on any number of phenomena including biodiversity loss, erosion, sedimentation, flooding, and the loss (or gain) of other system services.

Plans and indicators, of course, should be based on actions that have shown convincing results and that continue to show promise given the problems and potentials of interest to the USAID/Brazil Environment Program. However, room should be left to take advantage of opportunities not defined or known in advance. Generally the major difference between a strategy that works and a "plan" that does not work has to do with "flexibility." Success of the 2003–2007 Environment Program Strategy will require that the strategy be flexible and move beyond the successes of the past. As discussed in section five, flexibility has been part of the Mission's comparative advantage.

Appendices

An Impact Assessment and Framework for Discussing the 2003–2007 Strategic Plan of the USAID/Brazil Environment Program

Appendix 1:
Terms of Reference for the Assessment of USAID/Brazil's Environmental Program

1.1 Background

Brazil has tremendous importance to the United States. As the world's tenth largest economy and a significant trading partner, Brazil has proven itself a dependable partner in the hemisphere. Brazil is also critical to U.S. citizens because of important global issues, such as the effects of environmental degradation of Brazilian rainforests and the associated impacts on Global Climate Change and the loss of biodiversity and tropical forests.

USAID/Brazil is beginning the process of preparation for the development of a new strategic plan that is to be submitted in 2002 for the period 2003–2007. In the spring of 2001, the Mission will submit the Resource Request for FY 2003. This R4 needs to be informed by and will itself inform the development of the new Strategic Plan (SP) for the Mission. This task order is designed to provide a review and analysis that will provide a foundation for those efforts.

The overall dollar value of USAID's program in Brazil is modest relative to other donors' investments. However, because of its comparative advantage, USAID is able to catalyze other efforts and have significant secondary and tertiary effects. USAID's advantages include: the ability to design, implement and evaluate programs; the flexibility and ability to react quickly to new developments; the ability to marshal local and global expertise with experience in all sectors; and, experience with a wide array of stakeholders, ranging from indigenous communities to the leaders of government and industry. In the health sector, USAID has leveraged its efforts by assisting local and state institutions in the design and management of larger programs. In environment, the objective has been to improve natural resource management beyond project boundaries. This has been accomplished by providing information and models that have been replicated in areas adjacent to project sites and that have been utilized in the design of other programs, enterprises, regulations and institutions. Impacts beyond target areas also are facilitated directly through capacity-building and training programs.

The majority of the USAID/Brazil program focuses on the environment, and the bulk of that program is centered on three issues of global environmental concern—forest and biodiversity loss and global climate change. Brazil has globally important biodiversity and several ecosystems have been identified as priority areas for biodiversity conservation in global and regional analyses. These biodiversity-rich, priority ecosystems include: the Amazon; the Atlantic Coastal Rainforest; the Pantanal wetlands and the Cerrado (savanna). The Amazon forests form the largest forested ecosystem left on earth. The importance of the Amazon, not only for biodiversity but also for global climate change and the hydrologic cycle, should not be underestimated.

Since the late 1990s, USAID/Brazil has had an environment program which has focused its attention on the Amazon. The portfolio of projects has primarily consisted of applied, biophysical research on biodiversity and the forest ecosystem dynamics, and socio-economic analysis of natural resource management decisions by communities and individuals that impact on forests and protected areas. The current Strategic Objective (SO) of the environment program calls for "environmentally and socio-economically sustainable alternatives for sound land use management adopted beyond target areas." However, there has not been a systematic review of the entire portfolio, its strengths and weaknesses, in relationship to the evolving nature of the environmental problems, the program's overall impact, and the evolving context of other donor programs and the societal and governmental context within Brazil. In light of evolving needs and capabilities, new partnerships and priorities need to be considered. Beyond the Amazon, there is recognition that there are other globally important ecosystems in Brazil that deserve attention. These other ecosystems may offer a greater return on investment as lessons learned over the past decade in the Amazon may be modified and applied with lower investment costs.

USAID does not have a formal bilateral agreement with the Government of Brazil (GOB) and implements its activities through: US PVOs and NGOs such as World Wildlife Fund (WWF), The Nature Conservancy (TNC), Conservation International (CI), Woods Hole Research Center (WHRC), Tropical Forest Foundation (TFF) and their Brazilian affiliates; USG agencies such as USDA Forest Service and the Smithsonian Institute; and U.S. academic institutions (University of Florida and State University of New York – SUNY/Albany). As such, USAID's ability to influence policy is possible through its ability to provide information and examples, which are made available and can be utilized by anyone who wishes. Also, there is considerable

sensitivity by parts of the overnment of Brazil (GOB) to possible U.S. interventionism, particularly in regard to the Amazon.

The Mission believes that this evaluation of the effectiveness of these programs "beyond target areas" and a strategic analysis of gaps and opportunities is a crucial first step in the Mission's strategic planning process, which will be fully underway in 2001–2002.

1.2 Title

Mission Strategic Plan Preparation–Program Impact Evaluation: An analysis of Impacts, Gaps and Opportunities for USAID/Brazil in addressing Global Issues

1.3 Objective

To provide a review of the effectiveness of the USAID programmatic efforts in the environment in meeting the Mission Strategic Objectives (SOs) and the Mission Program Plan (MPP). To conduct an analysis of gaps and opportunities in the sector to provide a foundation for the review of the Mission Resource Request (spring 2001) and next Strategic Plan (2002).

1.4 Statement of Work (SOW)

The purpose of this SOW is to design a process for and the content of a two-phased report which USAID/Brazil needs in order to evaluate the strengths and weaknesses of the majority of its programs as one of the first steps in its overall strategic planning process. In addition, the Mission requires weekly summaries of documents reviewed; interviews and any preliminary analysis which takes place and upon which the two documents will based. These documents will provide a basis for preparation of portions of the R4 submission in spring 2001 and for its SP in 2002.

The first part of the report, an "assessment of impacts beyond target areas," will examine the broad impacts of USAID programs in SO1 in Brazil. This phase will examine the evolving nature of the issues and threats related to the conservation and sustainable use of biodiversity and forest issues. It will also document gaps and opportunities in the portfolio and the institutional capacity of partners. The first piece of work will feed into a strategic planning session of an annual environmental

partners' meeting, as a point of departure for an overall Mission Strategic Planning Effort.

The second part of the report, a "framework for discussion of the strategic plan," will build on information in the review to provide a starting point for the discussions of the new SP. This report will examine the programs of other USG agencies, other donors, IFIs and the GOB; it will also examine other ecosystems, strategic approaches, and new potential partners for the USAID/Brazil program.

The report will be based on reviews of existing documents; discussions with USG employees and representatives of partners; and interviews with other NGOs, donors, and local and national GOB officials.

1.4.1 The documents should address the following questions:

A) Assessment of impacts beyond target areas

How effective are current programs in target areas?

How effective are current programs in catalyzing change beyond target areas? In buffer zones and surrounding areas? As models of action supported by other donors? As models of action by other communities, NGOs, businesses and individuals within Brazil? As models for the GOB to consider in the formulation of programs, policies and regulations?

What are the key components or activities, which influenced the impacts beyond, target areas? What more could have been or should be done to influence impacts outside target areas?

How sustainable are the programs that USAID is currently funding?

How sustainable are USAID partners and USAID-financed programs in Brazil. Will currently funded programs continue if USAID chooses not to fund them as part of the new strategy? Will USAID partners and their counterparts survive in Brazil if USAID chooses not to implement programs through them in the new strategic plan?

What is the synergy with the energy SO insofar as Global Climate Change?

B) Framework for discussion of the Strategic Plan

What ecosystems are the conservation and sustainable use priorities in Brazil?

How important are they regionally and globally?

What are the threats to the priority ecosystems?

What are other donors doing in these ecosystems? Are they adequately addressing the threats?

What is the GOB doing?

Are there gaps?

Are there opportunities? E.g., are there management or training interventions USAID might finance which would cause other programs to function better; interventions that would leverage other sources of funding such as the Development Credit Authority?

Where does USAID have a comparative advantage in its ability to make a positive contribution to the global issues of: the conservation and sustainable use of biological diversity; and, the mitigation of global climate change effects of deforestation?

1.4.2 Tasks

i) Review and analysis of existing USAID planning, reporting and assessment documents e.g., lessons learned, quarterly and annual reports from partners, reports from mission annual meetings, SP and R4s, and program reviews (WWF, TNC, PESACRE). (See annex 1 for a complete listing)

ii) Weekly contact with Mission Technical Lead to report on progress towards results including timeline and allocation of resources and review any modifications of the work program

iii) Meetings with partners on success and viability of programs and institutions, successes beyond project borders, and gaps and opportunities for future programs.

iv) Field visits and interviews with project participants and "non-partners/participants" e.g., local officials, community leaders, representatives of non-participating NGO representatives, academics and businessmen. These interviews will be used to determine the success and lessons of the programs, the sustainability or ongoing need for the program, the impacts beyond project boundaries and gaps and opportunities going forward. Approximately six trips are envisioned outside of Brasilia; they would include the Pantanal, Mata Atlantica, and several to the Amazon. Details to be worked out with Technical Leads.

v) An analysis of overall effectiveness of "influence on land use decisions beyond target areas, what has worked what has not and why.

vi) Review other programmatic efforts (beyond USAID) addressing similar issues of the loss of forests and biodiversity and global climate change issues, e.g.,

- USAID/W
- IFIs
- UN Agencies
- Other donors
- Brazilian Government
- NGOs and academic
- Other USG agencies
- Pilot Program to Conserve the Brazilian Rain forest (PPG-7) member

vii) Consultation and interviews with representatives of other programmatic actors. Several other donors active in the sector have expressed an interest in participating in the process (most notably, the U.K.'s Department for International Development, DfID). Effort should be made to accommodate their participation. This effort should include an attempt to include them on field teams and should go beyond the review of documents and interviews that should be undertaken for most major donors.

viii) Consultation with national leaders of civil society NGOs and academics. A list of crucial and recommended contacts will be developed in consultation with the Technical Leads.

ix) Meeting in Brasilia, arranged by the Contractor, with USAID/Mission reps and other participants in the field trips from USAID and other donors and other key personnel designated by the Mission Technical Lead to discuss preliminary findings before the final reports are drafted.

x) Presentation of the second draft to and discussion with a group of experts gathered together by the Mission to provide input on the upcoming Strategic Plan, on or about November 16.

1.5 Reports and Deliverables

The contractor will provide the following specific deliverables in form and substance acceptable to USAID. (See Section 1.6 Report Presentation for language requirements and numbers of copies.) An estimated completion date for the presentation of intermediate drafts and the final report is given in each case. These dates may be adjusted and confirmed by approval of the final work plan by the Technical Leads.

Product #1 Work Plan

The contractor, and the technical team will work closely with and be supervised by the Technical Leads from Washington and the Mission, under the overall supervision of the CTO to produce a detailed workplan for the overall assignment. The work plan shall include a timeline, for all activities, which will lead to completion of an approved draft, to the Technical Leads by November 13. This will provide the basis for a Mission discussion with environmental leaders identified, which the contractor team leader will attend and present a draft report to (see task x above). The timeline will include the dates and schedules for presentation, of each product, team member participation in the preparation of products and appropriate refinements which must be agreed to by technical leads concerning the content, format and presentation of products 3–6 below. It will also include a tentative schedule for field trips and interviews and review meetings. (See 1.4.2 Tasks, above). The work plan will also include a refined budget for allocation of resources and identify the personnel for each position. All personnel must be approved by the Technical Leads. The contractor shall also work with other counterparts including other key USAID/Brazil

personnel, non-contractor members of the team, and key contacts suggested by the Technical Leads, as appropriate. Work plan will be discussed weekly by the team leader and the Mission Technical Lead, as described in task 1.4.2 ii, above. Activities and changes to the work plan may be approved by either technical lead. A record of all such changes will be given in writing to both technical leads and the CTO.

Product #2 Weekly summaries of documents reviewed, interviews and analysis to the Mission Technical Lead.

Product #3 Fortnightly reports, to the Technical Leads, on progress towards completion and work plan implementation, including allocation of resources and timeline.

Product #4 Assessment of impacts beyond target areas

Phase One of a report covering the effectiveness of USAID programs beyond target areas (approximately 20 pages + annexes.) Review of the G-7 Pilot Program to Conserve the Brazilian Rain Forest (PPG-7) project should not be included the review of USAID programs. However, the results of an on-going Mid Term Review of the PPG-7 should be taken into account for the purposes of this Evaluation. Phase one, of the report, should address the Questions listed above in Section 1.4.1 (A) Assessment of impacts beyond target areas. It should be organized to include the following sections:

- Executive summary,
- What has worked,
- What has not worked,
- Analysis,
- Gaps and opportunities suggested by the current program portfolio, and
- Conclusions.

Product #5 Framework for discussion of the Strategic Plan

Phase two of the report should be an annotated framework of possible directions and components of a future Brazil Mission Strategy to address global environmental issues and natural resources management (Approximately 20 pages + annexes.) The

report should address the questions listed above in Section 1.4.1 (B) Framework for discussion of the Strategic Plan. It should be organized to include the following sections:

- Executive summary;
- The importance of Brazilian ecosystems for Global issues, especially biodiversity, climate change and tropical forest conservation and sustainable use;
- What are other donors doing;
- What is the Brazilian Government doing;
- Comparative advantages of USAID;
- Opportunities for programs with multiplier effects, which catalyse other efforts or which have an impact beyond target areas; and
- Conclusions.

Product #6 Donor coordination matrix

Prepare a matrix of current and planned assistance of other donors in the environment based on ecosystem and activity type and with funding amounts and dates included. To be included as an annex to work product #5.

1.6 Report Approval and Presentation

Products 1, 2, 3 and 6 are necessary only in English.

For Products 4, 5 and 6, draft copies should be available to the Technical Leads, for comments and recommendations, two weeks following the completion of field work and the meeting described above in Section 1.4.2 ix.

Products 4 and 5 should include a Portuguese translation of the executive Summary, starting with the second draft.

A second draft, suitable for distribution and discussion, of Products 4, 5 and 6 will be consolidated and 200 copies and a diskette of the entire document will be delivered to the Mission by November 13.

The final draft of products 4, 5 and 6 should incorporate input gained in the Mission arranged "experts strategic discussion" to be held in Mid November (see 1.4.2 (x) above).

The final draft will be required Two weeks after approval of the final draft by the Mission.

1.7 Technical Direction

Technical directions during the performance of this task order shall be provided by the Technical Leads, John Matuszak, G/ENV and Eric Stoner, Mission/Brasilia, in cooperation with Kim Sais, the G/ENV CTO.

Technical Leads will supervise field reports, visits, and writing. USAID Environment team with selected participation from USAID/W, G/ENV, LAC/RSD and PPC will assist as appropriate as members of the team. Representatives of other donors, designated by the Technical Leads may also participate in the team based upon their availability. In addition, both of these groups and any other key personnel identified by the Technical Leads may participate in the field review session at the end of the fieldwork, which is described in 1.4.2 ix, above.

1.8 Terms of Performance

The work will commence on the date noted in Block 7 of the cover page., on or about Aug 28. Completion of the Final product is targeted for January 2000. The draft reports are time sensitive and must be completed in time for the Experts Meeting being arranged by the Mission in mid-November.

1.9 Personnel and workdays ordered

See annex 3–proposed budget

All contractor personnel on the field team must be bilingual in English and Portuguese. The contractor's field team is envisioned to include three experts, one from the U.S. who is familiar with USAID procedures, products and requirements and two members of the contractor's field team should be Brazilian nationals or residents with experience in the environment sector.

Contractor personnel will be supplemented, as appropriate, with representatives from USAID and from other donors active in the environment sector (see 1.4.2 vii above).

Technical Leads will assist the contractor in identifying appropriate individuals. Mission requires approval of all personnel.

Personnel should have appropriate, MS level training and experience.

Expertise necessary includes:

- NMR Economics/Policy Expertise–team leader (U.S.)
- Natural Resource/Forestry/Biodiversity Management Expertise (U.S.)
- Economics/Natural Resource Policy Expertise (CCN)
- Natural Resource/Forestry/Biodiversity Management Expertise (CCN)
- Other Expertise (to be determined) (CCN)
- Note CCN = Client country national

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Appendix 2:
Program Personnel Contacted by the Assessment Team

Name	Organization	City
Alex Moad	USDA/FS	Washington, DC
Ana Cristina Fialho de Barros	IPAM	Belém
Carlos Antonio Rocha Vicente	SEFE	Rio Branco
Claudia Becker	CI	Washington, DC
Claudio Valladares Padua	IPE	Brasília
Daniel Nepstad	WHRC	Woods Hole, MA
Darrell A. Jenks	U.S. State Department	Brasília
David Cleary	TNC/Brazil	Brasília
Eric Stoner	USAID	Brasília
Ernani J. S. Pilla	USAID	Brasília
Evandro Bayeri Togneri	IBAMA/Acre	Rio Branco
Heraldo Luis Vasconcelos	PDBFF/INPA	Manaus
Humberto Candeias Cavalcanti	IBAMA/PROARCO	Brasília
Idelcleide Rodriques Lima	IBAMA/Acre	Rio Branco
Irving Foster Brown	WHRC	Rio Branco
Jacqueline Villarreal	PESACRE	Rio Branco
Jamie Cavelier	WWF	Washington, DC
Jan Engert	USDA/FS	Washington, DC
Janice Weber	USAID	Brasília
Jeff Brokaw	USAID	Washington, DC
Johan C.Zweede	FFT	Belém
John Matuszak	USAID	Washington, DC
Leandro Valle Ferreira	WWF	Brasília
Lou Ann Dietz	WWF	Washington, DC
Luis Paulo Pinto	CI	Belo Horizonte
Mara Regia di Perna	WWF-Pro. Nat. Viva	Brasília
Marcelo Araújo	IESB	Ilheus
Maria Isabel Lessa da Cunha	MCT	Brasília

Name	Organization	City
Maria Jose Gontijo	SUNY	Brasília
Mario Cohn-Haft	SI/PDBFF	Manaus
Marianne Schmink	UF	Gainsville, FL
Miguel Morales	USAID	Asunción, Paraguay
Miguel Scarcello	Ass.SOS Amazonia	Rio Branco
Monica Borges Gomes Assad	IBAMA-PROARCO	Brasília
Muriel Saragoussi	FVA	Manaus
Patricia Delamonica Sampaio	PDBFF-INPA	Manaus
Paulo Barreto	IMAZON	Ananindeua
Peter Cronkleton	UF	Rio Branco
Reinaldo Lourival Francisco Ferreira	CI	Campo Grande
Roberto Smeraldi	FOE	São Paulo
Roberto Cavalcanti	CI	Brasília
Rosa Maria Lemos de Sa	WWF	Brasília
Rui Rocha	IESB	Ilheus
Solange Maria G. de Loveira	IBAMA-Acre	Rio Branco
Thomas T. Ankersen	UF	Gainesville, FL
Victor Bullen	USAID	La Paz, Bolivia

Appendix 3:
Documents Consulted

1. Anon. 2000. 'Collaboration and Communication in the "Caatinga" of Brazil.' *New Agriculturist On Line*. http://www.new-agri.co.uk/00-2/develop.
2. Crespo. S. *et al*. 1998. *O que o Brasileiro pensa do meio ambiente, do desenvolvimento e da sustentabilidade*/What Brazilians Think of the Environment, Development and Sustainability. MAST/ISER/MCT. Rio de Janeiro.
3. Conservation International. 2000. *Where Are the Hotspots: The Atlantic Forest of Brazil*. Hotspots. CI. Washington, D.C.
4. Crisman. Thomas L. 2000. 'Wetland Ecotones and the Role of the Private Sector in Conservation and Management of the Pantanal.' In *The Pantanal of Brazil, Bolivia and Paraguay*. Waterland Research Institute. Gouldsboro, PA.
5. Dourojeanni, Marc. 2000. *IDB Investments in Brazilian Protected Areas During the 1990s*. Working Paper. Inter-American Development Bank. Washington, D.C.
6. Dourojeanni, Marc. 1999. *The Future of the Latin American Natural Forests*. Environment Division Working Paper. Inter-American Development Bank. Washington, D.C.
7. Ferraz de Lima, José A. 2000. 'The Integrated Effort of the Brazilian Government Towards Areas under Federal, State and Private Protection.' In *The Pantanal of Brazil, Bolivia and Paraguay*. Waterland Research Institute. Gouldsboro, PA.
8. Friends of the Earth. 1998. *Políticas Públicas para a Amazônia. 97/98 Rumos, Tendências e Propostas*. Grupo de Trabalho Amazônico. São Paulo.
9. Gottgens, Johan F. 2000. 'The Paraguay-Paraná Hidrovia: Large-scale Channelization or a "Tyranny of Small Decision."' In *The Pantanal of Brazil, Bolivia and Paraguay*. Waterland Research Institute. Gouldsboro, PA.
10. Hoffmann, William A. 1998. *Demographic Effects of Fire on Woody Plants of the Cerrado Savanna of Central Brazil*. EPA. IBGE/JBB. Brasília.
11. Holmes, Thomas P. *et al*. 2000. *Financial Costs and Benefits of Reduced-Impact Logging in the Eastern Amazon*. TFF/USAID/USDA/CIFOR/ITTO. Alexandria, VA.

12. IDB. 2000. *Plan to Protect Brazil's Pantanal Gets $82.5 Million IDB Loan*. Inter-American Development Bank Press Release, December 7, 2000. http://www.iadb.org/exr/PRENSA/2000/cp22300e.htm.

13. IISD. 2000. 'A brief Introduction to the Convention to Combat Desertification (CCD).' *IISD/Linkages*. http://www.iisd.ca/linkages/desert/ccdintro.html.

14. Indufor, STCP and E.labore. 2000. *Report of the Mid-term Review of the Pilot Programme to Conserve the Brazilian Rain Forests (PPG-7)*. Brasília.

15. IRG. 2000. *Assessment of USAID Brazil's Environmental Program. Draft Workplan*. September 29, 2000. International Resources Group, Ltd. Washington, D.C.

16. Lele, Uma, *et al*. 1999. *Forest in the balance: Challenges of Conservation with Development—An Evaluation of Brazil's Forest Development and World Bank Assistance*. Operations Evaluation Department. Washington, D.C.

17. Nepstad, D.C., A.G. Moreira, and A.A. Alençar. 1999. *Flames in the Rain Forest: Origins, Impacts and Alternatives to Amazonian Fire*. PPG-7. Brasília.

18. New York Botanical Gardens. 1999. *The Atlantic Coastal Forest, an Overview*. http://www.nybg.org/bsci/res/bahia/AF-Over.html.

19. Sawyer, Donald. 2000a. *Current Status and Future Prospects for Action on Environment in Brazil*. Report prepared for the Brazil Office of the United Nations Development Program (UNDP). ISPN. Brasília.

20. Sawyer, Donald. 2000b. *USAID Annual Meeting on Environment, 2000*. ISPN. Brasília.

21. Sawyer, Donald. 2000c. *Influence of the GEF/UNDP Small Grants Program on Public Policy in Brazil*. ISPN. Brasília.

22. Sawyer, Donald. 1999. *USAID Annual Meeting on Environment*. ISPN. Brasília.

23. Sawyer, Donald. 1997a. *Cooperative Evaluation of the Smithsonian Institution's Activities under the USAID/Brazil Global Climate Change Program*. ISPN. Brasília.

24. Sawyer, Donald. 1997b. *Cooperative Evaluation of Woods Hole Research Center Activities under the USAID/Brazil Global Climate Change Program*. ISPN. Brasília.

25. Sawyer, Donald. 1997c. *Cooperative Evaluation of Environmental Protection Agency Activities under the USAID/Brazil Global Climate Change Program*. ISPN. Brasília.

26. Secretariat for Biodiversity and Forests. 1999. *First National Report for the Convention on Biological Diversity*. Ministry of Environment. Brasília.

27. Schwartz, Christian. 2000. 'Até Onde a Amazônia Pode Resistir?' *Veja*. No 47. 22 de novembro.

28. USAID/Brazil. 2000a. *Results Review and Resource Request (R4) FY 2002*. 4 April, 2000. Brasília.

29. USAID/Brazil. 2000b. *Brazil Environment Program Profile (Draft)*. USAID. Brasília.

30. U.S. Congress. 1999. *H.R. 2870-3. Debt Reduction for Developing Countries with Tropical Forests (Tropical Forest Conservation Act)*. Washington, D.C.

31. U.S. Embassy-Brazil. 2000. *Mission Program Plan*. U.S. Embassy. Brasília.

32. USDA/FS. 2000. *Semi-Annual Report. Brazil Program*. USDA Forest Service. International Programs. Washington, D.C.

33. Vasconcelos, Heraldo L. 1999. *BDFFP Semi-Annual Report on Enhanced Training and Outreach*. INPA. Manaus.

34. Vincent, Carol Hardy. 1998. *98-576 ENR: Desertification Treaty: Evolution, Status, and Key Issues*. Congressional Research Service, Report for Congress. Washington, D.C.

35. World Bank. 1998a. *Brazil: Managing Pollution Problems. The Brown Environmental Agenda.* Volume I: Policy Report. World Bank. Washington, D.C.

36. World Bank. 1998b. *Brazil: Managing Pollution Problems. The Brown Environmental Agenda.* Volume II: Policy Report. World Bank. Washington, D.C.

37. World Bank. 1996a. *Brazil: Managing Environmental Pollution in the State of Rio de Janeiro.* Volume I: Policy Report. World Bank. Washington, D.C.

38. World Bank. 1996b. *Brazil: Managing Environmental Pollution in the State of Rio de Janeiro*. Volume II: Policy Report. World Bank. Washington, D.C.

39. WWF. 2000. *Biomes, Caatinga*. http://www.wwf.org.br/wwfeng/evec07.htm.

Appendix 4:
Federal Protected Areas in Brazil

Category	Units	Number	Total Area (Km²)	% of National Territory
Strict Preservation	National Parks	44	112,730	1.31
	Biological Reserves	24	25,061	0.29
	Ecological Stations	21	21,659	0.25
	Ecological Reserves	5	6,857	0.06
	Areas of relevant ecological interests	17	677	<0.01
Subtotal		111	166,984	1.95
Sustainable Use	Environmental Protection areas	26	68,358	0.79
	National Forests	49	152,337	1.78
	Extractive Reserves	17	33,118	0.36
Subtotal		92	253,813	2.96
Total		**203**	**420,797**	**4.92**

Source: Fundação Instituto Brasileiro de Geografia Estatística (http://www.Ibge.gov.br), and IBAMA, 2000.

Appendix 5:
Major Recent Highlights on Environmental Programs Carried Out by the MMA

- In 2000, the pioneer National Environment Program (PNMA), created in 1991 with a US$117 million loan from the World Bank and loans and grants from Germany and counterpart funds, enters its second stage. At the beginning, it avoided use of international funds in the Amazon, a taboo which has now been overcome.

- The National Environment Fund (FNMA) received a loan of US$50 million from the Inter-American Development Bank (IDB) to support projects of government agencies and NGOs up to US$700,000.

- By August 2000, the Pilot Program to Conserve the Brazilian Rain Forest (PPG-7), which includes numerous sustainable development projects, has used only US$102 million or 29 percent of the overall commitment (US$ 351 million), and 44 percent of already contracted funds (US$232 million). The Participants' Meeting in October 1999 established increased Brazilian ownership of the program in a managed partnership with a Joint Steering Committee.

- Sustainable tourism is being promoted for the first time in Brazil through the Program for Development of Ecotourism in the Legal Amazon (PROECOTUR), with support from the IDB. A total amount of US$212 million is expected to be invested until 2004 in infrastructure in the Amazon.

- Biotechnology in the Amazon is the focus of the SCA's Brazilian Program of Molecular Ecology for Sustainable Use of the Biodiversity of the Amazon (PROBEM), another pioneer attempt to take advantage of Brazil's vast biodiversity.

- In 1999, the SCA undertook groundbreaking negotiation of Positive Agendas to reduce deforestation in the nine states of the Legal Amazon, negotiating with government agencies, private enterprise (primarily loggers and ranchers), and civil society. This was the first time the MMA went beyond promoting conservation and sustainable use of biodiversity (e.g., ecotourism and biotechnology) to deal directly with the causes of deforestation and biodiversity loss, which had previously been skirted. A joint working agenda was set up in June 2000.

- The revolutionary National Water Resources Policy of 1997, which involves a watershed approach and provides for participatory river basin committees and charging for use of water, previously a free resource, is in the process of being implemented through creation of the National Water Agency (ANA). The greatest challenges are to implement management systems that do not coincide with political boundaries, to control the broader development processes that affect water quantity and quality, and to collect fees and administer financial resources.

- The National Program of Biological Diversity (PRONABIO) carries out studies, supports research, organizes data bases, manages the clearinghouse mechanism, works with indicators, and prepares the national reports for the Convention on Biological Diversity (CDB), among other activities related primarily to information and analysis.

- PRONABIO is supporting development of an integrated environmental strategy and action plan for the Cerrado, an important and threatened but neglected biome.

- The MMA is now responsible for the Ecological–Economic Zoning (ZEE), which was previously under the Secretariat of Strategic Affairs (SAE) and which may be transferred to the Ministry of National Integration (MI). Zoning has been difficult to put into practice because of conceptual problems (whether zoning should be descriptive or prescriptive), technical difficulties of combining natural resources and socioeconomic data, and the inherent limitations of zoning enforcement

Other Government Agencies and Policies

- The overarching public policies that have environmental impacts include the Pluriannual Plan (PPA) and the *Avança Brasil* program, which provides for nine National Axes of Integration and Development. The environmental impacts of the PPA and the axes have not been evaluated. The MMA has begun negotiations with the National Bank of Economic and Social Development (BNDES) regarding such evaluations. It would be important to include their results in future annual revisions of the PPA.

Other federal programs explicitly related to environment are located in other ministries or agencies. Some of the main examples are:

- Sanitation activities are supported by the Ministry of Planning, Budget and Management (MPOG), which spent 69 percent of the budget funds allocated for all environmental purposes in Brazil between 1995 and 1998, much more than MMA.

- Activities of the new Ministry of National Integration (MI) include the PLANAFLORO and PRODEAGRO programs, which are being carried out in the states of Rondônia and Mato Grosso with support from the World Bank.

- The Ministry of Science and Technology (MCT) is responsible for the Pilot Program projects related to science centers and directed research as well as various research programs related to environment.

- The National Indian Foundation (FUNAI) in the Ministry of Justice (MJ) is responsible for the Integrated Project for Protection of Indigenous Lands and Populations of the Legal Amazon (PPTAL), which has supported the demarcation of 22 million hectares.

- The Green Protocol program provides for limits on credit from official banks, most of which are in the Finance Ministry (MF), to enterprises that do not conform with environmental legislation, constituting a novel combination of economic instruments and command and control.

Highlights of policies in other sectors that are relevant to environment include:

- Because of international and domestic pressure, the energy sector began to absorb environmental concerns in its planning for generation of hydroelectric power in the 1980s. Plans for expansion were scaled down, at least in the 1990s. Privatization is under way. The nuclear program, on the other hand, has been less open to pressure. A plan to conserve electric power and work on wind energy is being undertaken in the Northeast. Thus, there are both opportunities and contradictions in the energy sector.

- In the transportation sector, the government has actively promoted the automobile industry through incentives for installation of new factories in Brazil and tax cuts for consumers. Public transportation has received little attention. The government has also promoted infrastructure projects such as roads, waterways, and railroads with little concern for environmental consequences. The transportation sector is one of the most reluctant to take environment seriously.

- The Agricultural Policy of 1991 is advanced conceptually but has not been put into practice by the Ministry of Agriculture and Supply (MA). Agricultural programs and research emphasize expansion of exports without much concern for environment. Pesticides are not under strict control. There is great need to incorporate environmental concerns in the MA, which remains reluctant.

- The Ministry of Agrarian Development (MDA), which recently became responsible for family agriculture, in general, in addition to agrarian reform, has begun to seek environmental sustainability in its programs. It prohibited settlement in primary forest and is implementing the Green Factory concept of integrated family farming, incorporating environmental concerns.

- The Ministry of Health (MS) supported the participatory preparation of a National Plan of Health and Environment in 1995 for a Pan American Health Organization (PAHO) conference, but the plan has not been put into practice and the links between health and environment have been neglected because of the urgency of improving health care services.

- Through their specialized agencies, the Ministries of Education (ME) and of Science and Technology (MCT) play an important role in training human resources for work in the environmental area. Environmental education is regulated by a new law, which seeks integration into regular school curricula.

- The new Ministry of National Integration (MI) is defining its role, which will necessarily involve some environmental concerns. These might include environmental and social impact studies and application of environmental criteria in the use of constitutional funds and fiscal incentives for regional development.

- Ecological value-added tax (ICMS ecológico), providing state-level incentives for local governments to create conservation units and improve waste disposal, among other measures, have been approved in the states of Minas Gerais, Paraná, Rondônia and Mato Grosso and could be extended to other states. The State Participation Fund (FPE) and the Municipal Participation Fund (FPM), managed by the federal government, could incorporate similar environmental criteria. In 1999, a bill for this purpose was almost approved in the Senate.

On the whole, environmental and social programs have been secondary under the current administration, as compared to the goals of economic stabilization and reduction of the federal deficit. However, the President recently affirmed that he will increase the emphasis on social and environmental priorities in his second term.

The PPA for 2000–2003 signals incorporation of some principles of sustainable development, at least at the level of discourse, which can be considered a major accomplishment of the 1990s and a basis for more effective results in the next decade.

International cooperation will continue to play an important role in the environmental area. More than 70 percent of the total value of environmental projects surveyed in 1992 was for sanitation, urban pollution control, and other urban environmental projects. Thus, the allocation of resources did not confirm the common belief that funding was influenced unduly by alarmist views on deforestation in the Amazon.

Appendix 6:
Activities under USAID/Brazil Environmental Program (Strategic Objective 1)[18]

Main Component: Biodiversity Conservation

Subcomponent: Conservation Management

1. Management Plan for Jaú National Park in the Central Amazon

   U.S.-based partner: WWF

   Local partner: Fundaçao Vitória Amazônica (FVA)

2. Extractive Reserves Project

   U.S.-based partner: WWF

   Local partner: Institute for the Environment and Natural Resources (IBAMA), a GOB agency

3. Ecotourism

   U.S.-based partner: Conservation International (CI)

   Local partner: Institute for Social and Environmental Studies of Southern Bahía (IESB)

4. Biodiversity Policy Initiative

   U.S.-based partner: WWF, CI

   Local partner: various local NGOs

5. Protection of the Atlantic Coastal Rainforest

   U.S.-based partner: CI

   Local partner: IESB

[18] Strategic Objective (SO 1): Environmentally and socio-economically sutainable alternatives for sound land use adopted beyond target areas

6. Management Plan for Serra do Divisor National Park in the Western Amazon

   U.S.-based partner: TNC

   Local partner: IBAMA and SOS Amazônia

7. Parks in Peril (PiP) Project in the Guaraqueçaba Environmental Protection Area in Paraná State

   U.S.-based partner: TNC

   Local partner: Society for Wildlife Research and Environmental Education (SPVS)

8. G-7 Science Centers and Directed Research Component

   U.S.-based partner: WB

   Local partner: Brazilian Ministry of Science and Technology

Main component: Sustainable Forest Management

Subcomponent: Reduced-Impact Forest Management

9. Models of improved forest management

   U.S.-based partner: TFF, USDA/FS, UF

   Local partner: Institute for Man and the Amazon Environment (IMAZON), FFT

10. Training in Sustainable Forest Management

    U.S.-based partner: WWF/SUNY joint program; USDA/FS, TFF

    Local partner: FFT/CIKEL

11. Community Forestry and Forest Inventories

    U.S.-based partner: WHRC

    Local partner: WWF/SUNY

Subcomponent: **Fire Science and Management**

12. Fire preparedness activities

    U.S.-based partner: WHRC, USDA/FS

    Local partner: Amazonian Institute for Environmental Research (IPAM)

13. G-7 Fire Prevention Control

    U.S.-based partner: WB

    Local partner: Amazon Working Group (GTA)

14. Fire Monitoring and Fire Risk Information Dissemination

    U.S.-based partner: WB, USDA/FS (PSW), NASA, NOAA, U.S. Department of the Interior

    Local partner: IBAMA, Brazilian Air Force (FAB) Brazilian National Space Research Institute Weather Forecast and Climate Studies Center (INPE/CPTEC)

15. Fire Control Techniques

    U.S.-based partner: WHRC

    Local partner: IPAM

16. Fire Risk and Control

    U.S.-based partner: USDA/FS, TFF, WHRC

    Local partner: IPAM

Subcomponent: **Agroforestry Systems**

17. Agroforestry Development Program for Small Producers in the State of Acre

    U.S.-based partner: UF

    Local partner: Research and Extension in Agroforestry Systems Group (PESACRE)

Subcomponent: **The G-7 Pilot Program to conserve the Brazilian Rain Forest**

18. G-7 Pilot Program to Conserve the Brazilian Rain Forest (PPG-7)

    U.S.-based partner: WB

    Local partner: Brazilian Ministry of Science and Technology

19. NASA's "Large Scale Biosphere-Atmosphere Experiment in Amazonia"

    U.S.-based partner: NASA

    Local partner: Museu Paraense Emilio Goeldi (Belém); National Research Institute of the Amazon (INPA), EMBRAPA

Main component: Environmental Education and Communication

Subcomponent: **Environmental Education and Training**

20. Training of Brazilian Conservation Professionals (*Natureza e Sociedade* Program)

    U.S.-based partner: WWF/SUNY

    Local partner: several local NGOs

21. Environmental Education

    U.S.-based partner: WWF

    Local partner: several local NGOs

22. Biological Dynamics of Forest Fragments Project (BDFFP)

    U.S.-based partner: Smithsonian

    Local partner: National Institute for Amazonian Research (INPA)

Main component: Cross-Cutting Programs

23. Managing Ecosystems and Resources with Gender Emphasis (MERGE) Program

    U.S.-based partner: UF

    Local partner: Various Brazilian NGOs

Appendix 7:
Characterization of Private Sector Actions in Brazil

Categories of Enterprise's Environmental Behavior

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Agriculture and cattle raising	- Legal disobedience - Dependent on new land conversions - Low economic profit - Control over the majority of remaining natural areas - Low-level technology use	- Intensive use based on increased technology use - Targeted to commodities (global markets) - Targeted to better geographic and infrastructure conditions - Favorable to environmental compensation	- Focus on reduction of raw materials - Interest in voluntary certification - Fears environmental barriers - Success in reduced tillage farming	- Refuses transgenics - Focus on organic production - Interest on ethic consumption - Limitations on cost of production and supply capacity
Timber production	- Responsible for market supply - Legal disobedience - Unsustainable practices - Continuous migration after resource depletion - Middlemen for commercialization - Informal (unregistered) operation	- Constraints to abide by the law - Constraints on economic profit - Dependent on large tracts of land - Potential client of the National Forests (Flonas)	- Interest to reach international market and developed countries - Interest to add value - Interest in voluntary certification - Difficulty to organize productive chain	- Restricted to few community based initiatives

[19] Refers to enterprises with conservative (traditional, legal noncompliance) environmental behavior.

[20] Refers to enterprises complying with the environmental law only. Their standing is more pro-active than the conservative group although they lag behind the strategic or eco-development groups.

[21] Refers to enterprises which go beyond legal compliance and perceive the environment as an strategic opportunity to improve competitiveness and market position.

[22] Refers to enterprises which couple production ethics and social accountability with environmental concerns. For them, social and environmental aspects of the operations are as important as the business goals.

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Fisheries	- Responsible for majority of market supply - Unsustainable production practices - Disputes with local communities - Low-level technology use - Informal organization	- Partly linked to processing industry - Increasing investments in fish and seafood farming - More intensive use of technology	- Focused on sports fishing - Interested in protecting rivers and watersheds - Potential conflict with commercial fishing	- Targeted to some communities - Great potential for organizing models of sustainable development associated to ecological corridors
Oil and Gas Activities	- Legal disobedience - Technological obsolescence - Incapacity to deal with environmental crises and accidents - Conflicting relationship with local communities	- Interested in legal counseling - Investment in technology - Focused on international standards - Great understanding of environmental costs	- Proactive legal standing - Use of principles of social accountability - Use of voluntary certification systems - Transparency	
Mining	- Legal disobedience - Environmental liabilities - Operates mainly on informal basis	- Uses environmental licensing - Reclaims degraded areas - Does not partake with communities nor has social programs	- Proactive legal standing - Seeks international certification - Strong environmental management - Investments in social and environmental programs - Conservation units within property - Investment in prevention - Transparency	

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Food processing industry	- Legal disobedience - Low profile with environmental liabilities - Operates mainly on informal basis	- Environmental licensing - Complies with legal pollution emission levels - Focus on internal market	- Strong corporate environmental policy - Investment in environmental marketing - Investment in social programs - Sustainable practices not used by raw material contractors	- Supply restricted markets - Concerned with traceability - Abhors transgenics - Interested in ethical environmental consumption - Limitation of production costs and capacity to supply the market demand
Textile industry	- Legal environmental disobedience - Low profile with environmental liabilities - Use of forced labor - Operates on informal basis - Large dependency on imported raw materials	- Environmental licensing - Complies with legal pollution emission levels - Focus on internal market - Legal labor relations	- Looks for certification - Environmental care in production - Investment in environmental marketing - Investment in social programs	- Restricted to community-based handicrafts - Based on natural materials
Paper and cellulose		- Environmental licensing - Low participation in social programs - Legal labor relations - Occupational health - Focus on internal market	- Proactive legal standing - Focused on external market demands - Full certification - Important natural areas - Community support programs - Promotes transparency to improve constituency with neighbors	

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Rubber and Plastic	- Small informal enterprises are sources of major pollution	- Complies with environmental legislation - Responds to a major part of packaging market - Focuses mainly on supply of tires - Participates in sustainable initiatives but has difficulty in implementing recycling	- Some enterprises make efforts in the complete cycle of their products - Participates in business associations for recycling - Products with raw materials of natural origin	- Initiatives oriented toward sustainable products
Steel and metal industries	- Energy inputs from illegal sources - Use of forced labor in production processes - Market competitiveness based on unsustainability of inputs and informality - Oriented toward foreign market	- Regulation of activities - Difficulties in adjusting production processes and in compensating environmental liabilities of industrial sites	- Seeks certification - Interested in finding a place in international markets - Investment in improving the development of partners in the production process	
Electronic equipment and computers	- Major network assembling equipment with smuggled components - Informal labor - Directs its waste toward public urban collection systems	- Majority of the enterprises operating in the market - Not engaged in sustainability aspects - Suffers from illegal competition	- Exhibits improvement of environmental aspects according to internationally developed standards - Participates in social programs - Has potential for environmental programs	
Beverages	- Multiplicity of small initiatives without capability to satisfy basic legal requirements - Growing market share	- Most of the market - Problems in working with the chain, mainly inputs and packaging	- Concerns with marketing usually linked to natural inputs - Some enterprises exploit their traditional roots - Potential to support environmental programs	- Products looking for a market niche - Local and traditional organizations attempting to find a place in the market

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Automotive industry	- Smaller-scale enterprises importing cheap vehicles - Show below-average environmental compliance	- Most of the market - Manages to improve environmental compliance depending on requirements and cost reduction - Interested in supporting environmental, social and cultural programs	- Environmental improvements are added in small increments due to high costs - Major improvements are restricted to prototypes	
Recycling industry	- Operates informally based on collection through “trash dealers” - Is not licensed and produces high levels of pollution	- Has basic documentation - Has difficulty in organizing a chain of legal suppliers	- Usually associated with large enterprises for recycling waste and packaging	- Regulation initiatives through “trash dealers” - Reutilization and recycling with strict environmental standards
Energy	- Co-generators without anti-pollution investments - Large-scale projects initiated in the past, which do not satisfy present-day requirements	- Most of the sector - Have important environmental liabilities and need time to adjust	- Invest in marketing with support for social and environmental programs	- Operate with alternative solutions - Occupy a growing, although still marginal market - Few initiatives offering integrated solutions
Water, drainage and sewerage services	- Many of these services do not measure up to legal criteria - Costs are brought up as a major argument - There is an enormous environmental liability due to lack of service delivery to match up the demand, and to inadequate solutions	- Gradually new projects are complying with environmental rules - Opportunities for privatization will put pressure on resolving liabilities	- Potential for activities through private operators - Some enterprises attempt to offer differentiated services	

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Construction	- There are still enterprises operating informally - Waste volumes are enormous due to lack of planning, appropriate technology and technical assistance	- Large-scale enterprises use subcontracting, which often conceals problems - Concerns with safety and environment are growing - They are adopting corporate policies for compliance with rules	- Introduction of recycling and waste reduction goals - Investments in social and environmental programs - Focusing on real estate market interested in differentiated products	- Initiatives for sustainable settlements focused on life and nature integration
Tourism industry	- Operation of mass tourism - Environmentally irresponsible tourism increases problems of destinations not prepared to receive visitors - Lack of concern for local contexts	- Attempts to implement environmental education campaigns - Licensing initiatives	- Initiatives of carrying capacity for destinations - Concern with architectural standards - Investment in labor and basic services - Interested in certification and foreign markets - Seeking integration of investments with local interests	- Restricted to few initiatives - With growth potential dependent upon market position
Transportation	- Dominates the supply of this service - Has difficulties in obtaining licensing - Has an enormous environmental liability - Does not deal with negative externalities	- Position of concession holders - Needs time to resolve liability	- Potential for parkways - Waterways attempt to show their advantages but are not convincing due to externalities	
Telecommunications		- Position of concession holders - Difficulties with aesthetic aspects - Highly competitive market based on price and quality of service	- Few initiatives supporting environmental projects	

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Financial sector	- There are no social or environmental initiatives	- Most of the sector - "Money does not have marks from the places where it has been if the operation is recorded and legitimate"	- Consistent initiatives to separate the roles of sustainable activities - Support to corporate environmental programs - Several support efforts based on major players in the sector - Legal requirements for public credit operations	- Experience with micro-credit - Initiatives oriented toward specific areas (e.g., extractivism)
Real estate sector	- Dominates the market - Creates *"de facto"* situations which avoid environmental evaluations - Occupies illegally public areas and of restricted use - Utilizes spontaneous occupations to consolidate urban expansion strategies	- Occupies part of the market - Has difficulties with legal conflicts at the municipal, state and federal levels - Usually does not implement licensing agreements due to lack of means and control	- Occupies a differentiated market that provides quality in properties - Uses strong marketing - At times, the design of properties shows elements of integration with the natural landscape	- Alternative properties that attempt to integrate sustainability products harmonizing the proximity of natural areas, low consumption, recycling and respect for socio-cultural contexts.
Hygiene and cosmetic products	- Small products without the capacity to invest in environmental concerns	- Most of the market - Complies with legal requirements - Seeks to be associated with environmental themes	- Attempts to utilize natural products with origin certification - Invests in training for traditional producers - Fears being accused of appropriating traditional knowledge - Invests in research and development, and adopts ethical agreements in laboratory tests - Strong environmental and social marketing	

Business Sector	Conservative[19]	Legal-Abiding [20]	Strategic [21]	Eco-Development[22]
Pharmaceutical industry	- No relation with environmental initiatives - Weak quality control - Systematic problems related to failures in production processes	- Complies with rules, but does not have environmental initiatives	- Invests in environmental development with strong corporate policy and structure - Associates with environmental projects as a sponsor - Seeks to associate its products with corporate environmental values - Complains about lack of rules of access to biodiversity	- Initiatives that seek to organize sustainable production chains of medication usually originating from medicinal plants
Chemicals	- Enterprises with frequent accidents - Occupies the market that supplies raw materials for other industries - Has no adequate monitoring of waste disposal - Frequent conflicts with surrounding communities	- Complies with general rules - Usually evaluates the possibility of certification - Has regular safety procedures	- The safety theme is part of the institutional culture - Is active in social and environmental programs - Has a structure dedicated to environmental management and safety - Invests in adequate certification of residues	