

U.S. Agency for International Development

**Conservation of
Tropical Forests and Biodiversity**

Program Update

Internal Working Document

February 1994

**ENRIC
Environment and Natural Resources Information Center**

Contract No. DHR-5517-C-00-1075-00

**Datex, Inc.
2101 Wilson Boulevard, Suite 100
Arlington, VA 22201
703-812-5000**

Table of Contents

List of Acronyms	vii
Highlights—FY 1992 and Early FY 1993	
USAID Tropical Forest and Biodiversity Conservation	1
Preface	7
Chapter 1: The USAID Tropical Forest and Biodiversity Conservation	
Program: An Evolving Commitment	9
1.1 The USAID Environment Strategy	11
1.2 Strategic Program Shifts	12
1.2.1 Applying the Lessons of Experience	13
1.2.2 Promoting Human Resource Development	14
1.2.3 Providing Longer-Term Funding for Projects	14
1.2.4 Promoting Policy Dialogue and Increasing Nonproject Assistance	15
1.2.5 Increasing the Role of the Private Sector	16
1.2.6 Coordinating and Cooperating with Other Institutions	17
1.3 Evolving Technical Responses	19
1.3.1 Emphasizing Natural Forest and Ecosystem Management	21
1.3.2 Emphasizing <i>in Situ</i> Conservation	22
1.3.3 Increasing the Emphasis on the Socioeconomic Context	23
1.4 Program Funding	25
Chapter 2: Working to Save Tropical Forests and Biodiversity:	
The Context for USAID Programs	35
2.1 The Loss of Tropical Forests and Biodiversity	35
2.1.1 The Value of Forests and Coastal Regions	37
2.1.2 Genetic Diversity and Food Crops	39
2.2 Losses of Biodiversity through Deforestation	40
2.3 How to Bring These Losses under Control	42
2.3.1 Improved Forest Management	42
2.3.2 Protecting Tropical Forests and Biodiversity	43
2.3.3 Nondestructive Economic Uses of Forests	45
2.3.4 Choosing Priorities for Protection	46
2.4 Making a Difference	49

Chapter 3: Centrally Funded Programs	51
3.1 Tropical Forestry and Agroforestry Projects	52
3.1.1 Forestry/Fuelwood Research and Development	52
3.1.2 Forest Resources Management II	54
3.2 Biodiversity Conservation	64
3.2.1 Wildlands and Human Needs	64
3.2.2 Conservation of Biodiversity	67
3.2.3 Project Noah	73
3.2.4 Coastal Resource Management	75
3.3 Environment and Natural Resource Management	81
3.3.1 Management of Fragile Lands	81
3.3.2 Property Rights and Tenure	83
3.3.3 Policy, Planning, and Management Assistance	85
Chapter 4: USAID Activities in Africa	91
4.1 New Activities	93
4.1.1 Natural Resource Policy and Analysis	93
4.1.2 Madagascar: Policy Reform for Biodiversity Conservation	94
4.1.3 Ghana: Castles and Parks	96
4.1.4 The Gambia: Community Resource Management	97
4.2 Ongoing Projects	98
4.2.1 Mission and NGO Support	98
4.2.2 Southern Africa: Living with Wildlife	102
4.2.3 Cameroon: Genes from the Wild	104
4.2.4 Rwanda: Biodiversity and Sustainable Agriculture	104
4.2.5 The Congo: Habitat Protection	106
4.2.6 Mali: On-Farm Tree Planting	110
4.2.7 Regreening the Hills of Cape Verde	111
4.2.8 Managing Natural Resources in Semiarid Senegal	113
Chapter 5: USAID Activities in Asia	117
5.1 New Activities	118
5.1.1 United States-Asia Environmental Partnership	120
5.2 Ongoing Projects	121
5.2.1 India: Plant Genetic Resources	121
5.2.2 The Philippines: Natural Resources Management Program	122
5.2.3 Indonesia: Natural Resource Management	124
5.2.4 South Pacific: Developing Marine Resources	125
5.2.5 South Pacific: Profitable Environmental Protection	129
5.3 Country Program: Focus on Nepal	127
5.3.1 Forestry Development	132
5.3.2 Institute of Forestry Project	133
5.3.3 PVO Co-Financing II	133
5.3.4 Rapti Development Project	134
5.3.5 Related Efforts	135
5.3.6 New Program Directions	135

Chapter 6: USAID Activities in Latin America and the Caribbean	137
6.1 New Activities	138
6.1.1 Bolivia: Promoting Sustainable Forest Use	140
6.1.2 El Salvador: Preserving Mangrove Ecosystems	140
6.1.3 El Salvador and Honduras: Environmental Protection Funds	140
6.1.4 Peru: Improving Natural Resource Management	142
6.1.5 The Caribbean: Advancing Environment and Coastal Resource Management	143
6.1.6 Belize: Natural Resource Management and Protection	145
6.1.7 Panama: Natural Resource Management	145
6.1.8 Nicaragua: Natural Resource Management	146
6.1.9 Addressing Global Climate Change Through Forest Conservation	148
6.2 Ongoing Projects	151
6.2.1 Central America: Regional Environmental and Natural Resources Management	151
6.2.2 Guatemala: The Maya Biosphere Natural Resource Management Project	158
6.2.3 Strengthening Parks to Conserve Biodiversity	160
6.2.4 Costa Rica: Natural Resource Management and Community Development	162
6.2.5 Costa Rica: Forest Resources for a Sustainable Environment	165
6.2.6 Haiti: Targeted Watershed Management	166
References	171
Index by Country or Region	177
Index by Organization	179
Index by Project	181
Appendix A: Tropical Forest and Biodiversity Conservation Portfolio FY 1992	183

Boxes

Box 1.1:	Profitable Conservation	18
Box 1.2:	USAID Cooperation and Coordination with Other Organizations	20
Box 1.3:	Innovative Approaches to Biodiversity Conservation: Integrated Conservation and Development Projects	24
Box 1.4:	One Obligation, Two Objectives: Avoiding Double Counting of Funding Overlap	27
Box 2.1:	The Economic Value of Biodiversity	38
Box 2.2:	Changing Local Attitudes Toward Forest Destruction	44
Box 2.3:	Nature-Based Tourism	47
Box 3.1:	USAID Nurtures International Forestry at the U.S. Forest Service	56
Box 3.2:	Protecting Biodiversity through Conservation Education: USAID and the Peace Corps	63
Box 3.3:	USAID Funds Biodiversity Research	68
Box 4.1:	Conserving Africa's Elephants	107
Box 6.1:	The Enterprise for the Americas Initiative	141
Box 6.2:	Policies That Destroy Forests	154
Box 6.3:	Country Program: Focus on Jamaica	163

Figures

Figure 1.1:	USAID Tropical Forest and Biodiversity Conservation Program, FY 1992-93	10
Figure 1.2:	Tropical Forest and Biodiversity Conservation Obligations (FY 1987-93)	26
Figure 1.3:	Tropical Forest and Biodiversity Conservation Obligations (FY 1987-93)	27
Figure 1.4:	Biodiversity Activities by Category of Development Assistance, FY 1992 Obligations	30
Figure 1.5:	Distribution by Percent of Forest and Biodiversity Funding, FY 1992	31
Figure 1.6:	Tropical Forest and Biodiversity Conservation Obligations, Distribution by Bureau	32
Figure 4.1:	Bureau for Africa, FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations	92
Figure 5.1:	Bureau for Asia, FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations	119
Figure 6.1:	Bureau for Latin America and the Caribbean, FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations	139

Tables

Table 1.1:	Top Ten Projects in the Tropical Forest and Biodiversity Conservation Portfolio, FY 1991-93	29
Table 1.2:	USAID Tropical Forest and Biodiversity Conservation Funding by Bureau	33
Table 2.1:	Estimates of Tropical Forest Cover Area and Rate of Deforestation by Geographical Subregion	36
Table 6.1:	Major RENARM Activities	153

List of Acronyms

ACCESS	Access to Land, Water, and Other Natural Resources Project
AFRENA	Agroforestry Research Network for Africa
APE	Action Program for the Environment Project
BAA	Biodiversity Analysis for Africa
BCN	Biodiversity Conservation Network
BOSCOSA	Forest Conservation and Management Project
BSP	Biodiversity Support Program
CATIE	Center for Tropical Agricultural Research and Education
CCAD	Central American Commission on Environment and Development
CCC	Caribbean Conservation Corporation
CDIE	Center for Development Information and Evaluation
CFC	Congo Forest Conservation Project
CGIAR	Consultative Group on International Agricultural Research
CI	Conservation International
CICAD	Central American Regional Interparliamentary Commission on Environment and Development
CIMMYT	International Maize and Wheat Improvement Center
CNA	Conservation Needs Assessment
CNRM	Community-Based Natural Resources Management Project
COBRA	Conservation of Biodiverse Resource Areas Project
CONAP	National Council for Protected Areas
CORIN	Thailand's Coastal Resources Institute
CRM	Coastal Resources Management Project
DEMO	Development of Environmental Management Organizations
DESFIL	Development Strategies for Fragile Lands Project
DFA	Development Fund for Africa
EAI	Enterprise for the Americas Initiative
E/GCC	Environment and Global Climate Change
ELI	Environmental Law Institute
ENCORE	Environment and Coastal Resources Project
ENRIC	Environment and Natural Resources Information Center
EPA	Environmental Protection Agency
EPM	Environmental Planning and Management Project
ESF	Economic Security Fund
FAM	Food Aid Management
FDP	Forestry Development Project
F/FRED	Forestry/Fuelwood Research and Development Project
FLUP	Forestry and Land Use Planning Project
FONAMA	Bolivia's National Fund for the Environment
FORESTA	Forest Resources for Sustainable Environment
FRM	Forest Resources Management Project
FSP	Forestry Support Program
FUNDECOR	Fundación para el Desarrollo de la Cordillera Central Volcánica
GIS	Geographic Information System
ICDP	Integrated Conservation Development Project

ICRAF	International Council for Research in Agronomy
IF	International Forestry Office of the U.S. Forest Service
INBio	Costa Rica's National Institute for Biodiversity
INRENARE	Panama's National Institute of Renewable Natural Resources
IRENA	Nicaragua's Institute for Natural Resources and Environment
ISR II	Innovative Science Research II Project
IUCN	International Union for the Conservation of Nature (or) World Conservation Union
KEAPEM	Knowledge and Effective Application of Policies for Environmental Management Project
LAC	Latin America and the Caribbean
LAC TECH	Agriculture and Rural Development Technical Services
LIFE	Living in a Fragile Environment Project
LTC	Land Tenure Center at the University of Wisconsin-Madison
MARENA	Panama's Natural Resources Management Project
MOFE	Nepal's Ministry of Forests and Environment
MTAP	Market and Technology Access Project
NASA	National Aeronautics and Space Administration
NBPGR	India's National Bureau of Plant and Genetic Resources
NBRCS	National Biological Resources Conservation Strategy
NEAP	National Environmental Action Plan
NGO	Nongovernmental Organization
NIH	National Institutes of Health
NRMP	Natural Resources Management Program
NRMS	Natural Resources Management Support Project
NSF	National Science Foundation
PARCS	Protected Areas Resources Conservation Strategy
PARTS	Policy, Analysis, Research, and Technical Support Project
PASA	Participating Agency Service Agreement
PAWN	Planning and Assessment for Wildlife Management
PEP	Profitable Environmental Protection Project
PGR	Plant Genetic Resources Project
PIMAR	Pacific Islands Marine Resources Project
PNG	Papua New Guinea
PROMESA	Environment and Natural Resources Protection Project
PVO	Private Voluntary Organization
R&D	USAID/Bureau for Research and Development
RENARM	Regional Environmental and Natural Resource Management Project
ROTEP	Roots and Tubers Research Project
SADCC	Southern Africa Development Coordinating Committee
SAI	Special Assistance Initiative
SAVEM	Sustainable Approaches for Viable Environmental Management Project
SCFER	Southeastern Center for Forest Economics Research
SIRE	Sustainable Income and Rural Enterprise Project
SUBIR	Sustainable Uses for Biological Resources Project
TFAP	Tropical Forestry Action Plan
TNC	The Nature Conservancy
UNESCO	United Nations Education and Scientific Organization
URI	University of Rhode Island
US-AEP	United States-Asia Environmental Partnership
USAID	U.S. Agency for International Development

USFS	.....	United States Forest Service
USDA	.....	U.S. Department of Agriculture
WHNP	.....	Wildlands and Human Needs Program
WRI	.....	World Resources Institute
WWF	.....	World Wildlife Fund

Highlights—FY 1992 and Early FY 1993

USAID Tropical Forest and Biodiversity Conservation

Program Levels

- In FY 1993 USAID supported 161 projects engaged in tropical forest and biodiversity conservation activities in nearly 60 countries. USAID funding obligations for tropical forest and biodiversity conservation grew rapidly from FY 1987 to a high of \$167 million in FY 1992 before falling back to \$153 million in FY 1993. (See p. 9)

USAID Policy and Strategy

- USAID's *Environment Strategy*¹—a major policy statement published in 1992 that links environmental protection with sustainable development—specifically identified tropical forest and biodiversity conservation as one of five key priorities for action. (See p. 11.)
- All four USAID bureaus that deal with tropical forests—Africa, Asia, Latin America and the Caribbean, and Research and Development—have designated tropical forest and biodiversity conservation a programming priority in their regional environmental strategies. (See chapters 3–6.)

Conserving Biodiversity

- USAID is backing a spectrum of projects specifically aimed at conserving biodiversity around the world. (See, for example, Bulgaria, p. 71; Ghana, p. 96; El Salvador, p. 140; and Nicaragua, p. 146.)
- By supporting the highly successful Biodiversity Support Program (BSP)—a consortium led by World Wildlife Fund to conserve biodiversity in tropical forest ecosystems—USAID is testing new approaches, answering critical research questions, and building indigenous capacity, currently through more than 140 activities in 36 countries. (See p. 68.)
- In FY 1992 USAID launched its largest environmental policy reform program in Africa—the \$36 million Knowledge and Effective Application of Policies for Environmental Management (KEAPEM) project—which focuses on improving management of Madagascar's highly diverse and endangered biological resources. (See p. 94.)

Collaboration and Coordination

- As conservation strategies increase in complexity and the amount of money applied to tropical forest and biodiversity conservation expands, USAID has taken a lead role in promoting cooperation among donors, government agencies, nongovernmental organizations (NGOs), and local communities. (See Papua New Guinea, p. 70; the Forestry Development Project (FDP) in Nepal, p. 132; and the Natural Resources Management Support (NRMS) project, p. 98.)
- In Africa USAID has strongly supported National Environmental Action Plans (NEAPs), comprehensive, long-term strategies whose creation involves a full range of local and international organizations and agencies. USAID played a major role in creating NEAPs in Madagascar, Ghana, Rwanda, and Uganda and recently approved a \$22 million program in The Gambia to support the NEAP process. (See p. 86.)
- By supporting the African Biodiversity Consultative Group, a group of African development and conservation experts representing East, West, Southern, and Central Africa, USAID is encouraging African input on strategies for tropical forest and biodiversity conservation. In 1992, the group met twice to contribute to a strategy report for USAID's Africa Bureau. (See p. 71.)
- USAID continues to promote "South-South" exchanges—transfer and dissemination of knowledge among developing countries—through conferences, workshops, and reports. (See p. 66.)

Training

- USAID is committed to upgrading the skills of professionals working on the ground for tropical forests and biodiversity. During FY 1992, more than 200 park rangers and community extension agents in Latin America and the Caribbean received on-site training and instruction through the USAID-supported Parks in Peril project—four times the number trained in 1990 and 1991. (See p. 160.)
- To relieve the shortage of adequately trained park staff in East, Central, and southern Africa and prepare park managers for increasingly complex management roles, in FY 1992 USAID also launched the Protected Area Conservation Strategy (PARCS) project. (See p.70.)

- In FY 1992, under the Forest Resources Management II (FRM II) project, the USDA Forest Service Forestry Support Program provided technical assistance in support of USAID field activities in 24 countries through more than 100 technical consultations. Also funded by FRM II (see p. 54.), the Peace Corps conducted 67 technical workshops in 46 countries for Volunteers and their host country counterparts on a wide variety of environmental topics. (See pp. 57, 61, and 63.)

Policy Reform and Improvement

- In FY 1992 USAID extended and began to prepare a follow-on project for the 12-year-old, \$23 million Environmental Planning and Management (EPM) project (see p. 85), which funds the leading U.S. environmental think tank, the World Resources Institute, to help public and private institutions in developing countries incorporate sound environmental and natural resource management policies and strategies into national and local development planning.
- USAID's Latin America and the Caribbean Bureau prepared the report *Green Guidance for Latin America and the Caribbean*,² published in 1993. This document lays out USAID's approach for this region, emphasizing policy reform, economic incentive restructuring, and institution strengthening to improve the management and sustainable use of forests.
- As part of an effort to promote sound environmental policy in Central America, in FY 1992 the Regional Environmental and Natural Resources Management (RENARM) project funded inventories of environmental policies in five nations (Belize, Costa Rica, El Salvador, Guatemala, and Honduras), covering such areas as forest exploitation, wildland management, and coastal resources. Compiled into *The Green Book: An Environmental Policy Sourcebook*,³ the information facilitates an understanding of policy issues and alternatives for NGOs, donor agencies, and Central American policymakers. (See p. 151.)

Promoting Conservation Planning

- In Papua New Guinea, USAID backed a 15-month conservation needs assessment, in which a unique NGO-led process of information sharing and consensus decision making for environmental planning was developed. The approach provides a useful model for other efforts worldwide. (See p. 70.)
- USAID backed an unprecedented effort to consolidate the expertise of the many Brazilian and other biologists working in the Amazon Basin and to identify key sites for conservation in the region. The scientists developed a map and planning tool for government and conservation

organizations by identifying where the highest concentrations of particular species coincided with key protected areas in the basin. (See p. 46.)

Promoting Private Sector Solutions

- USAID encourages both NGOs and business to participate in tropical forest and biodiversity conservation efforts. (See Ghana, p. 96; Oceania, p. 129; the Philippines, p. 122; Indonesia, p. 124; and Nepal, p. 129.)
- USAID assistance in policy reform aided passage of legislation in Nepal that, among other reforms, ensures private and community tenure over forest resources and phases out parastatal timber corporations. (See p. 129.)
- USAID is supporting a number of efforts around the world to develop markets for sustainably harvested, nontimber forest products (see box 1.1, p. 18) and to promote ecotourism (see box 2.3, p. 47). The economic benefits that local people would derive as a result should encourage forest conservation.

Developing New Ways to Finance Conservation

- USAID is expanding support for innovative means to finance local environmental initiatives on a long-term, self-sustaining basis, such as endowment funds, which have been created through debt-for-nature swaps in the Philippines (see p. 122), Bolivia (see box 6.1, p. 141), and Jamaica (see box 6.3, p. 163).
- In May 1992, the first major debt-for-nature swap in Guatemala was completed as part of USAID's Maya Biosphere Natural Resources Management Project. The up to \$5 million swap is now generating a continuous flow of Guatemalan currency for conservation-based activities in the Petén region. This 14,000-square-mile sweep of tropical forest and savanna—one of the largest remaining in Central America—holds exceptionally rich biodiversity as well as the 1.5 million-hectare Maya Biosphere Reserve. (See p. 158.)

Promoting Innovation

- Developing and testing novel approaches to tropical forest and biodiversity conservation is being pursued through the Innovative Science Research II (ISR II) project (see box 3.3, p. 69); Biodiversity Support Program (BSP) pilot projects (see p. 68); the Policy, Analysis, Research, and Technical Support (PARTS) project (see p. 93); and the Pacific Islands Marine Resources (PIMAR) project (see p. 125).

- One of the most promising new developments in conservation at the field level, integrated conservation and development projects (ICDPs), combines the conservation of natural resources with the economic development of local communities. (See box 1.3, p. 24, Wildlands and Human Needs Program (WHNP), p. 64; Costa Rica's Forest Conservation and Management (BOSCOSA) project, p. 162; Nepal's Forestry Development Project (FDP), p. 132; Ecuador's Sustainable Uses for Biological Resources (SUBIR) project; the Maya Biosphere Natural Resources Management project, p. 158; and the Profitable Environmental Protection (PEP) project, p. 129.)

Applying Lessons Learned

- Through evaluations, workshops, technical reports, and other means, USAID increasingly emphasizes improving project design by learning from the successes and problems of earlier efforts. (See the Development Strategies for Fragile Lands (DESFIL) project, p. 81; the Knowledge and Effective Application of Policies for Environmental Management (KEAPEM) project, p. 94; and work being done under the Administrator's Evaluation Studies Agenda being implemented by USAID's Center for Development Information and Evaluation, p. 13.)

Preface

The subject of this report is the United States Agency for International Development's (USAID's) program to conserve tropical forests and biodiversity throughout the developing world. This report builds on the USAID report to Congress for FY 1990-91 on tropical forests and biodiversity, updating the program through FY 1992 and early FY 1993.

The objective of this report is to describe USAID's activities in tropical forest and biodiversity conservation. It describes how these efforts have come about and what they are achieving, and points the way for future initiatives to protect the tropical forests and biodiversity that represent an irreplaceable part of our human heritage. The report contains six chapters. The first provides an overview of programming strategy and implementation approaches as well as the vital statistics for the tropical forest and biodiversity conservation program. The second chapter covers the context of the program: the problems that are driving deforestation and loss of biodiversity, what these mean to people in the developing and developed world, and some of the avenues that are being explored to resolve these problems. The third chapter reviews projects managed by USAID's central bureaus, primarily the Bureau for Research and Development. The remaining chapters cover specific projects implemented by three USAID geographic bureaus.

The report provides short descriptions of 53 projects selected from the 161 projects supporting tropical forest and biodiversity conservation that were operating during FY 1992-93, including brief highlights of activities occurring during FY 1992 and early FY 1993.

The report's preparation began in October 1992. Outlines for individual chapters were prepared in coordination with bureau environment officers, who also reviewed two drafts of the chapter pertaining to their bureaus. The present report incorporates their comments.

Research and initial drafts were prepared by numerous consultants and ENRIC staff:

Chapter 1: Fred Swartzendruber, Sean Gordon, and John Michael Kramer

Chapter 2: Christine Haugen and Fred Swartzendruber

Chapter 3: Greg Booth, Fred Swartzendruber, and Rebecca Watts Hull

Chapter 4: Christine Haugen

Chapter 5: T. R. Ramanathan

Chapter 6: Raisa Scriabine and Elizabeth Gold

Data-base reports, funding analyses, and graphics were prepared by Steve Davis, Sean Gordon, Rebecca Watts Hull, and David Neufeld. Text editing was done by Nancy Morrison. Pamela Cubberly and Barbara Bever were responsible for production editing.

Overall technical editing and organization of the report as well as supplementary research, analysis, and writing was carried out by John Michael Kramer, ENRIC assistant director. Peter Freeman, ENRIC director, provided overall supervision and technical editing. Dan Deely, USAID/R&D/ENR project officer, provided invaluable guidance, review, and critique throughout preparation and production.

ENRIC gratefully acknowledges the cooperation of numerous USAID staff in the Research and Development, Africa, Asia, and Latin America and the Caribbean Bureaus in providing project documentation and review of draft reports. In addition, we would like to thank the numerous grantees, contractors, and collaborating agencies that generously lent their assistance.

ENRIC
Environment and Natural Resources Information Center
Datex, Inc.
Arlington, Virginia
February 9, 1994

Chapter 1

The USAID Tropical Forest and Biodiversity Conservation Program: An Evolving Commitment

USAID programs in tropical forest and biodiversity conservation have grown rapidly in recent years in response to increasing concerns about the environmental and human consequences of the loss of forests and habitats in developing countries. In FY 1992-93, 161 projects in more than 56 countries engaged in activities in the areas of tropical forest and biodiversity conservation (see figure 1.1). To tackle root causes, the U.S. foreign assistance program has been a world leader in establishing innovative and effective conservation initiatives. Through both its own programs and financial and technical support to other international agencies, nongovernmental organizations (NGOs), and scientific research centers, USAID is playing a key role in improving the management of the natural resource endowment of tropical countries, home to the world's most diversified plant and animal communities.

The USAID commitment to tropical forest and biodiversity conservation is evident in the rapid growth of funding for these sectors since the mid-1980s. From a combined budget level of \$60 million in FY 1987, for example, USAID's annual obligations for tropical forest and biodiversity conservation reached a peak of \$167 million in FY 1992 before declining to an estimated level of \$153 million in FY 1993. Nonetheless, the FY 1993 levels represented an increase of 178 percent since FY 1987 (see figure 1.2). Strong support from the U.S. Congress has been an important factor in USAID's ability to respond to one of the most serious environmental challenges of our time. Cooperation with other U.S. government agencies, such as the U.S. Forest Service and the U.S. Peace Corps, as well as private voluntary organizations (PVOs) and other donor agencies, has also increased significantly (see p. 22).

Terminology

Biodiversity. By biodiversity USAID refers to the variety and variability among living organisms and the ecological complexes in which they occur. It can be measured at four levels: biomes (e.g. tropical moist forests, coastal wetlands, etc.), ecosystems (a portion of a biome in which living organisms seem to be self-sustaining), species, and genetic varieties within species.⁴

Tropical forests. Ecosystems occurring within tropical latitudes with a minimum of 10 percent crown cover of trees and/or bamboos, generally associated with wild flora, fauna, and natural conditions, and not subject to agricultural practices. This includes forests in all ecological zones, the main tropical types of which are rain forests, moist deciduous forests, dry, and very dry forests.⁵

1.1 The USAID Environment Strategy

USAID support for tropical forests and biodiversity is at the core of environmental programming within the U.S. foreign assistance program. In developing a long-term strategy for addressing environmental problems in developing countries, USAID has examined the linkages between poverty and environmental degradation and found deforestation and biodiversity loss to be one of the key causes. These and other problems are defined in USAID's 1992 *Environment Strategy*,⁶ which sets forth strategic guidelines for assistance to achieve environmentally sustainable development. The strategy builds on USAID's strengths and its extensive experience in integrating environment and development. That experience began in 1976, when the Agency first adopted formal environmental regulations. The 1992 environment strategy revised, refined, and updated previous USAID statements on this subject, including the 1988 *Policy Paper on Environment and Natural Resources*,⁷ the 1990 *Environment Initiative*,⁸ and the 1991 *Environmental Strategy Framework*.⁹ As part of the Clinton Administration's refocusing of USAID, the environment strategy is again being revised with an even stronger emphasis on sustainability anticipated in 1994.

The 1992 strategy has addressed sustainability by:

- emphasizing activities that attack the root causes of environmental degradation and stress problem prevention,
- supporting programs that empower local people and promote their participation in development,
- improving scientific understanding and data collection, and
- promoting cooperation with other environmental and development organizations.

The 1992 environment strategy was complemented by bureau-specific statements through which USAID geographic bureaus defined regional environmental strategies, identified priorities for action, and provided guidance for programs, staffing, and funding.

The 1992 USAID environment strategy focused on five key areas:

- Tropical forests and biodiversity conservation
- Sustainable agriculture
- Environmentally sound and efficient energy production and use
- Urban and industrial pollution prevention and control
- Management of water, coastal, and wetland resources

The four USAID bureaus that deal with tropical forests—the Bureaus for Africa, Asia, Latin America and the Caribbean, and Research and Development—have developed their own environment strategies based on the framework provided by USAID's overall strategy. All four bureau strategies have made tropical forest and biodiversity conservation a programming priority (see chapters 3–6).

1.2 Strategic Program Shifts

As USAID programs in tropical forest and biodiversity conservation have expanded and become more prominent components of USAID's portfolio, significant changes have been made in the way project interventions are designed and implemented. Many of these

represent general or strategic shifts in the ways in which USAID programs and policies are carried out.

1.2.1 Applying the Lessons of Experience

Greater emphasis is being placed on applying the lessons learned from earlier efforts. Findings from evaluations, workshops, technical reports, and other sources of useful insights are now being channeled into the earliest stages of new project design. One example is the work being done under the Administrator's Evaluation Studies Agenda being implemented by USAID's Center for Development Information and Evaluation. This three-year (FY 1992-94) activity is conducting *ex post facto* reviews of USAID projects in tropical forest and biodiversity conservation in Pakistan, the Philippines, and Mali. Results will be synthesized in a report due in FY 1994.

In addition, USAID is supporting an increasing effort in longer-term networking among developing country professionals to strengthen the base of local expertise available to identify problems and find effective solutions. An example is the Development Strategies for Fragile Lands (DESFIL) project, which aims to understand better the factors affecting resource users' management of fragile land resources and to apply this knowledge effectively to make natural resource exploitation more ecologically sustainable (see p. 81). Synthesizing research results and disseminating these findings to a broad-based development community are central responsibilities of the project. Similarly, a new USAID project in Madagascar—Knowledge and Effective Application of Policies for Environmental Management (KEAPEM) (see p. 94)—exemplifies this new focus on integrating research results into a comprehensive policy reform process, one that will enable natural resource management to be implemented at the grass-roots level.

1.2.2 Promoting Human Resource Development

Training has traditionally been an important USAID activity. Programs in tropical forest and biodiversity conservation strengthen the human capacity for effective and sustainable natural resource management at all levels. For example, in sub-Saharan Africa, USAID is supporting a consortium of PVO groups, led by the Vermont-based World Learning Center, in an effort to improve the management and technical capacity of local NGOs and to promote information exchanges among African countries. Entitled the PVO/NGO Natural Resources Management Support (NRMS) project, this effort focuses on Cameroon, Madagascar, Mali, and Uganda and is working in particular to develop national networks of local NGOs capable of disseminating technical information, conducting technical workshops and short courses, and contributing to policy dialogues at the government level (see p. 98).

USAID's efforts to build widespread professional capacities among NGOs and local communities to increase their capacity to manage the development process more effectively are an important step to increasing innovation and quality of program design. With large influxes of donor funds from, for example, the World Bank's Global Environment Facility, increased effectiveness and public accountability are more important than ever. Large sums of money do not automatically translate into project impact if local NGOs and communities are not prepared to use the money effectively.

1.2.3 Providing Longer-Term Funding for Projects

USAID now commits funding for projects in tropical forests and biodiversity over longer time horizons than ever before. Some of the projects described in this report have life spans as long as six and even ten years—a situation rarely encountered only a few years ago. Moreover, many environmental projects are being extended into a second phase, building on successes of preceding efforts and incorporating lessons learned. A significant proportion of the USAID portfolio in tropical forest and biodiversity conservation consists of such second-generation projects, often with broader geographic scopes and higher funding levels than

their original phases. For example, the Forestry Resources Management II (FRM II) project, which funds technical assistance provided by the U.S. Forest Service to USAID overseas programs, is now in its second ten-year phase (see pp. 54, 55, 61).

Another aspect of the USAID commitment to a longer-term perspective can be seen in the recent moves to establish innovative long-term funding mechanisms—local environmental endowments. Designed to support local initiatives through self-sustaining financing mechanisms, these endowments may be capitalized through funds generated by debt-for-nature swaps. In Bolivia, for example, USAID helped to establish the National Fund for the Environment (FONAMA), financed by the U.S. dollar proceeds of a debt-for-nature swap carried out under the U.S. Enterprise for the Americas Initiative (EAI) (see box 6.1, p. 139). Environmental activities are now financed by FONAMA under the guidance of a board representing a wide spectrum of Bolivian society.

1.2.4 Promoting Policy Dialogue and Increasing Nonproject Assistance

Many environmental problems in developing countries are the result of inappropriate policies, notably those that indirectly or inadvertently encourage unsustainable agriculture and destructive logging practices. In recent years, USAID has made sectoral policy reform an important priority. Through policy dialogue with developing country governments and “nonproject assistance” funding, USAID enables financially stressed governments to carry out complex restructuring and streamlining of policies and services in important sectors such as forestry and agriculture.

For instance, in Uganda USAID launched the Action Program for the Environment (APE) project in FY 1991. Nonproject assistance from USAID is assisting the Government of Uganda in carrying out a comprehensive series of institutional and policy reforms to improve the ability of the private and public sectors to manage the country's natural resource base.

Another effort using nonproject assistance, Knowledge and Effective Application of Policies for Environmental Management (KEAPEM), is providing \$27 million to the Government of Madagascar, two-thirds of which is being used to service pressing external debts while the government undertakes important reforms to improve environment and natural resource management (see p. 94). In addition, a portion of the USAID nonproject assistance funding—the equivalent of \$12 million in local currency—is being used to establish a Malagasy environmental endowment for long-term financing of local conservation initiatives.

In Nepal, USAID's Forestry Development Project (FDP) is helping the government to implement the Master Plan for Forestry (see p. 132). A major component centers on policy reform that transfers natural resource management to the local level. With USAID support, the Ministry of Forests and Environment is phasing out the role of parastatal timber corporations in favor of management, production, and marketing activities carried out by communities and the private sector.

As these commitments indicate, USAID is engaging host country governments in policy dialogue, providing training and institution strengthening, and helping to ease foreign debt. USAID thereby helps focus interest and political will at the highest levels on environmental problems and secures tangible actions to address them. This approach, which is being tested in some of the world's poorest and most environmentally threatened countries, promises to become a useful vehicle for bringing about lasting improvements in the status of tropical forests and biodiversity.

1.2.5 Increasing the Role of the Private Sector

USAID's environment strategy assigns an important role to the private sector in developing countries, including local and national NGOs, as well as businesses. Many USAID projects in tropical forest and biodiversity conservation support groups that have organized themselves to tackle local environmental problems. Subgrants to such organizations, training programs

for their leaders, and support for network building and information sharing are important aspects of the USAID portfolio. (See also box 1.1.)

In addition, more attention is being paid to the positive contribution that can be made by private business interests, given the presence of appropriate incentives for them to become involved in resource management and conservation. For example, ecotourism is a new and rapidly growing market with strong potential to help make conservation of nature a profitable venture (see box 2.3, p. 46). Also, marketing of valuable nontimber forest products has the potential to change significantly the ways in which forests and the resources they contain are valued by local people as well as external investors. As the economic benefits derived from intact ecosystems begin to outweigh the arguments of those who advocate deforestation and overexploitation, individuals and groups will begin to support the control of unnecessary burning, limits to hunting and poaching, and improved logging management.

USAID strongly supports this new direction in conservation thinking and is encouraging an expanded role for the U.S. private sector through such ventures as the United States-Asia Environmental Partnership (see p. 120). In another innovative venture, USAID has provided \$3 million to Cultural Survival Enterprises to develop marketing mechanisms for nontimber rain forest products from Southeast Asia, Central Africa, and South America that are harvested using sustainable management techniques (see box 1.1, and box 2.1, p. 38).

1.2.6 Coordinating and Cooperating with Other Institutions

Cooperation and coordination with other development assistance donors, scientific research bodies, other U.S. government agencies, and NGOs are important aspects of USAID programs in tropical forest and biodiversity conservation. Coordination helps to allocate limited resources more effectively, avoids duplication and overlap of programs, and speeds

Box 1.1

Profitable Conservation

USAID-supported activities through Cultural Survival Enterprises and Conservation International (CI) are helping to generate income by marketing nontimber products from natural forests.

CI's program involves the sustainable harvesting of tagua nut (vegetable ivory) in northeastern Ecuador. The program employs 1,800 people in harvesting the palm nut and making it into buttons for clothing sold worldwide. More than ten million buttons have now been sold, and the tagua nut is in increasing demand for jewelry and artisanal carving items to replace elephant ivory.

CI is also helping improve harvesting and marketing of nontimber forest products such as chicle gum, allspice, and floral palms from the USAID-funded Maya Biosphere Natural Resources Management Project in Guatemala, providing income for 4,000–6,000 families (see p. 158). These exports also add \$4–\$6 million annually to Guatemala's economy.

A \$3 million loan from USAID helps Cultural Survival Enterprises market a variety of nontimber forest products, including Brazil nuts used in gourmet ice cream. A resource inventory of cola nuts at Korup National Park in Cameroon identifies sustainable sources for marketing to the Pepsi-Cola Co. Cultural Survival's new forest flavorings program certifies that companies use forest flavorings in their products and will give them a recognizable symbol to use on the product container.

USAID also supports studies on nontimber forest products and marketing through a variety of projects, including the Southern Africa Development Coordinating Committee (SADCC) Regional Natural Resources Management Project in southern Africa (see p. 102), the Senegal Reforestation Project (see p. 113), and the Biodiversity Support Program, which identifies and analyzes projects for future USAID funding (see p. 67).

the sharing of lessons learned from earlier efforts. For example, lessons learned during preparation of National Environmental Action Plans (NEAPs) in many African countries are now being applied in other environmental initiatives worldwide. These lessons include the

need to identify important sector constraints and linkages, to provide an effective organizational framework, and to focus interventions to gain maximum impact.

USAID's emphasis on cooperation and coordination reflects the fact that many USAID initiatives in tropical forest and biodiversity conservation contribute to complex, multicomponent programs supported by diverse donors. These programs often include policy reform measures, grants to NGOs, technical assistance, training, institution strengthening, environmental monitoring, information systems, and even the establishment of conservation foundations financed with local currency. Such programs require coordination at many levels, particularly where they are implemented along with strategic planning exercises. Good examples of this are programs implemented by USAID in Madagascar and Nepal.

As the scale of funding for environmental programs in developing countries and the number of large and small organizations and agencies involved increases, the possibility that efforts will be duplicated or work at cross purposes also escalates. Coordination becomes increasingly necessary. In addition, many innovative projects benefit from coordination simply because they are breaking new ground; the parties involved must meet to discuss how to tackle problems as they arise.

USAID believes donor coordination should not become an end in itself with its own structures and institutional mandates. Rather, coordination is best mobilized around specific and concrete topics that respond to emerging needs in ways that are appropriate to each situation (see box 1.2).

1.3 Evolving Technical Responses

USAID programs in tropical forest and biodiversity conservation have also evolved in terms of the technical approaches used in project interventions. Many of the shifts discussed below resulted from lessons learned during many years of experience gathered at the field level,

Box 1.2

USAID Cooperation and Coordination with Other Organizations

In many countries, USAID is taking a lead role in bringing together host country governments, donors, and international and local nongovernmental organizations (NGOs) to work toward consensus on communication and problem solving on environmental problems.

Donor organizations. In its tropical forest and biodiversity conservation program, USAID is focusing more carefully than ever on complementing the efforts of other donor organizations. USAID has taken a lead role in bringing together host country governments and donors and international and local NGOs to work for effective communication and joint problem solving on environmentally sound development, for example, in preparing National Environmental Action Plans (NEAPs).

Important new forums for coordination and cooperation have emerged in recent years in the field of tropical forestry. For example, USAID is playing an active role in the Forestry Advisors Group, a network of official agencies, and in NGOs concerned with development activities carried out under the multilateral Tropical Forestry Action Plan. USAID and the World Resources Institute (WRI) jointly produced a report analyzing future directions for donor coordination in the forestry sector. This report was presented at the Forestry Advisors Group meeting in San José, Costa Rica, in December 1992.

Nongovernmental organizations. USAID recognizes the importance of collaborating with and supporting NGOs in efforts to conserve tropical forests and biodiversity. A sizable proportion of the USAID environmental portfolio consists of grants with such organizations as World Wildlife Fund, CARE, The Nature Conservancy, WRI, and many other U.S. private and voluntary organizations. In addition, USAID invests substantial resources in training and institution strengthening for NGOs based in developing countries, thereby expanding local capacities for environmental management and reducing dependence on external assistance.

International bodies. Coordination and cooperation are also important roles for USAID at the international level. USAID is an active participant in specialized bodies such as the International Tropical Timber Organization, helping to guide key international policies—issues of fundamental importance for tropical forests and biodiversity.

U.S. government agencies. USAID also cooperates with other U.S. government agencies involved in research, training, extension, and other activities that can contribute to improved tropical forest management and biodiversity conservation. Through interagency cooperative agreements, USAID supports forestry programs of the Peace Corps (see p. 61) as well as National Science Foundation scientific research programs in developing countries

(see box 3.2, p. 63). USAID also maintains close working relationships with the U.S. Forest Service, the U.S. Environmental Protection Agency, and other U.S. agencies with environmental mandates or technical capabilities relevant to tropical forest management and biodiversity conservation.

During FY 1993, for example, the *Biodiversity Support Program* published a multidisciplinary study of the effects of climate change on the tropical forests of Central Africa. In one component of the study, the National Aeronautics and Space Administration and the University of Maryland demonstrated techniques for monitoring deforestation in Central Africa using low-cost remote sensing imagery from weather satellites operated by the Department of Commerce's National Oceanographic and Atmospheric Administration.

USAID will continue to emphasize the importance of coordination and cooperation in tropical forestry and the conservation of biodiversity through activities such as those mentioned above and others in the United States, in international forums, and in its day-to-day relationships with organizations working at the field level.

1.3.1 Emphasizing Natural Forest and Ecosystem Management

As scientists and resource managers have become more aware of the complexity of natural ecosystems, especially in tropical zones, and of the ecological disadvantages of simplified man-made systems, increasing emphasis has been placed on conserving natural systems wherever possible. In the past, reforestation efforts tended to center around the large-scale planting of selected species, such as eucalyptus or pine, often without regard for the loss of indigenous biodiversity. In some cases, remnant patches of natural forest were cleared to make way for monoculture stands of trees.

Because of the mixed results of past experience and recent scientific knowledge, USAID programs in tropical countries now place a high priority on improving the management of natural ecosystems and conserving as much of their biodiversity as possible.

Experience has shown that this approach is also far more likely to safeguard important environmental functions and services and at lower cost than alternative methods that replace highly complex (and often poorly understood) ecosystems with biologically impoverished substitutes.

A pilot effort emphasizing natural forest management was launched by USAID in FY 1980 in the National Forest of Guesselbodi, in a severely overgrazed and eroded site in Niger. The introduction of community-based, natural forest management has resulted in a visible improvement in vegetative regeneration within Guesselbodi, without the introduction of exotic species. A local woodcutters' association enforces a sustained management plan, paying the salaries of forest guardians from the revenues generated by sales of fuelwood and forage. This model, which is now being replicated elsewhere in the Sahel, has demonstrated that relatively low-cost techniques of natural forest management can help restore degraded ecosystems and conserve indigenous biodiversity. This project also illustrates the long-term commitment required—in this case over ten years—to foster major changes in natural resource management.

1.3.2 Emphasizing *in Situ* Conservation

Related to the renewed interest in conserving natural ecosystems is a strong belief that preserving endangered species is best carried out by preventing the loss of their natural habitats—conserving the species on-site, or *in situ*. USAID programs in tropical forest and biodiversity conservation give *in situ* measures the highest priority because prevention of loss tends to be less costly and more satisfactory than *ex situ* alternatives, such as zoos, botanical gardens, and seed banks.

In situ approaches offer the advantage of maintaining intact the intricate web of nutrient and energy flows characteristic of natural systems—an attribute not normally replicable under *ex situ* conditions. Moreover, *ex situ* techniques usually place individual

species in artificial settings in which they are no longer exposed to normal physical forces and biological competition. This has significant implications in areas such as crop breeding. A key function of the modern hybrid seed industry is to breed resistance to pests into crops such as wheat and rice. As pests evolve and develop resistance to pesticides, scientists will need access to naturally evolving plant and animal communities to find the genetic material needed to develop new resistant strains. The long-term benefits of an evolving gene pool are nearly incalculable and provide a powerful rationale for making *in situ* conservation a high priority for environmental action.

1.3.3 Increasing the Emphasis on the Socioeconomic Context

As the socioeconomic forces driving deforestation and biodiversity loss in tropical countries are better understood, projects are being designed to bring these trends under control and to include forest management by the people living in or near tropical forests and protected areas (see box 1.3). USAID has several programs under way that offer support to field missions in designing and implementing tropical forestry and biodiversity projects. Technical expertise is provided on a wide range of socioeconomic topics that can affect the success of conservation efforts.

For instance, the *Access to Land, Water, and Other Natural Resources II* (ACCESS II) project helps USAID missions and host country governments identify how land markets, tenure patterns, and gender issues interact in common property resource areas and in protected areas (see p. 83). Other major USAID projects involving socioeconomic factors in natural resource management include Kenya's Conservation of Biodiverse Resource Areas (COBRA) and Wildlands and Human Needs Program (WHNP) (see p 64).

Box 1.3

Innovative Approaches to Biodiversity Conservation: Integrated Conservation and Development Projects¹⁰

With the publication of the *World Conservation Strategy*¹¹ in March 1980, awareness of the need to integrate conservation of natural resources and economic development became a more prominent theme in the conservation community. Over a decade later, integrated conservation and development projects (ICDPs) are one of the most promising approaches to the conservation of biodiversity.

ICDPs are projects that seek to enhance the conservation of biological diversity in protected areas by focusing on the social and economic needs of people living in nearby communities. With a twofold goal of improving the management of natural resources and improving the quality of human life, ICDPs offer alternatives to protectionist conservation techniques. If properly implemented, ICDPs could successfully balance the needs of local people and the environment.

Increasingly, other USAID-supported protected area and conservation projects incorporate ICDP principles. During FY 1992, USAID supported such major ICDPs as the Forest Conservation and Management Project (BOSCOSA) in Costa Rica (see p. 162), Forestry Development Project (FDP) in Nepal (see p. 132), Sustainable Uses for Biological Resources (SUBIR) project in Ecuador (see p. 72), Maya Biosphere Natural Resource Management Project in Guatemala (see p. 158), Conservation of Biodiverse Resource Areas in Kenya, and the Profitable Environmental Protection (PEP) project in the South Pacific (see p. 129).

ICDPs are still in the experimental phase and therefore involve risk and uncertainty. As such, it is vital that ICDPs be monitored as test cases and the lessons learned disseminated to implementing agencies. USAID supports this learning process through World Wildlife Fund's Wildlands and Human Needs Program (WHNP) (see p. 64).

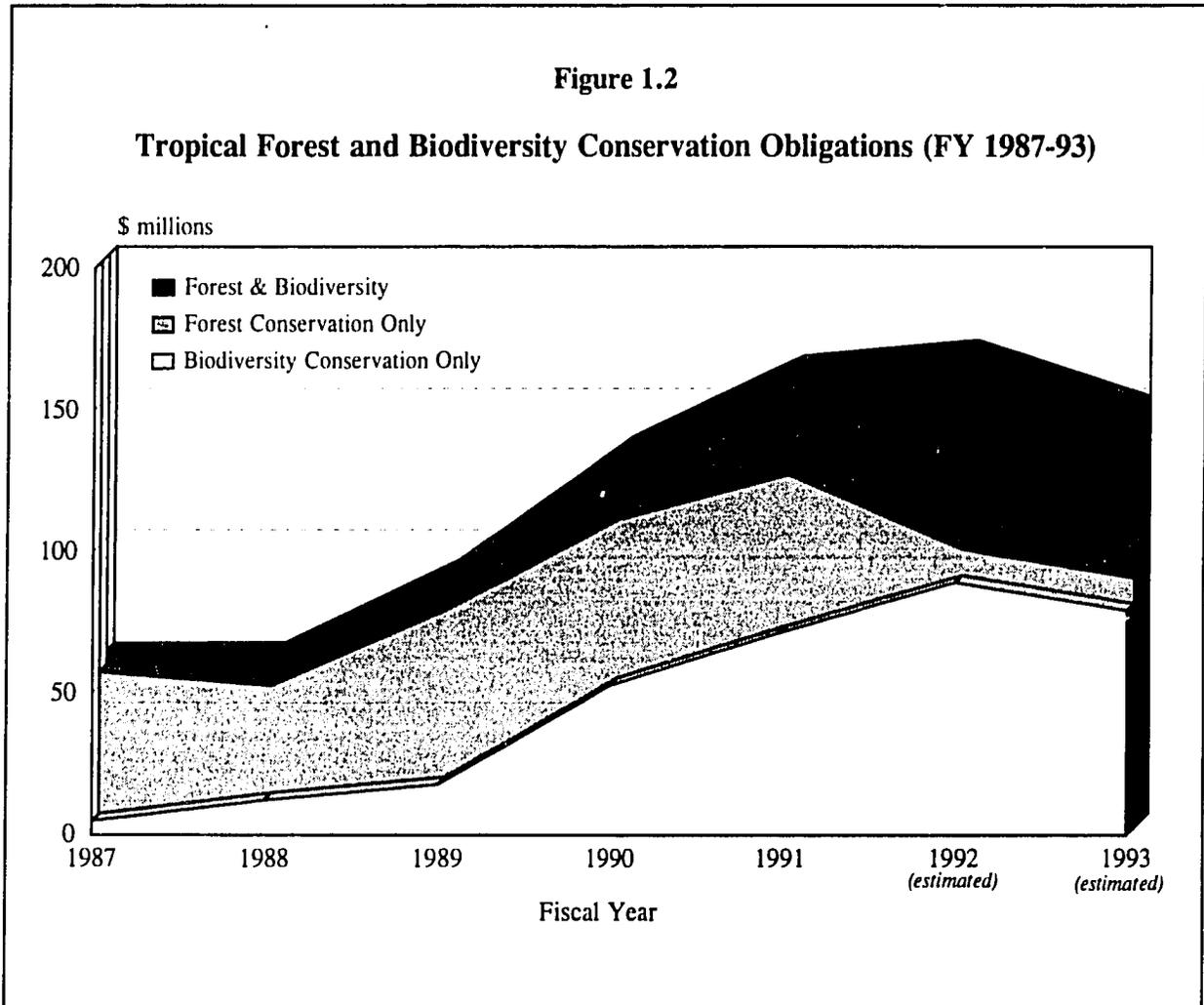
A recent USAID-funded report, *Designing Integrated Conservation and Development Projects*,¹² synthesized the knowledge and experience of a decade of ICDPs. Some major conclusions and recommendations from the report are summarized below.

- All material benefits from an ICDP should be clearly linked to the conservation activity. If the beneficiaries in a project do not *perceive* development benefits as incentives for sustainable natural resource management project, benefits may not have the desired impact. For example, the Korup Project in Cameroon provided training in poultry farming to encourage local people to stop illegal hunting. Many hunters do not consider this adequate compensation, and hunting has not significantly decreased.

- Project beneficiaries must be *equitably* involved in all phases of project implementation, from design through evaluation. One approach used by many project planners is *stakeholder analysis*, in which individuals and groups with a vested interest in the outcome of the project are identified and incorporated into all stages of design and implementation.
- The incorporation of *local knowledge systems* is critical to the design of ICDPs. In most situations, a project design has a greater chance to meet its development and conservation goals if it uses local systems than if it tries to impose externally developed technologies and institutions.
- Issues of *stewardship and ownership* are vital to ICDPs. In general, maximizing local responsibility and authority for the management of natural resources is most effective.
- ICDPs will not meet their stated goals unless adequate attention is given to the *policy environment*. During project design, it is important to review the relevant policies that can affect a project, identify changes necessary to enable project success, and assess the feasibility of achieving the changes.
- ICDP project planners must consider *biological and socioeconomic criteria* in selecting project sites, giving priority to areas where the value of biological resources is high, where host government actions indicate a commitment to biodiversity conservation, and where significant local participation and opportunities for sustainable economic return from natural resources exists.

1.4 Program Funding

During FY 1991-93, tropical forest and biodiversity conservation activities ranked second among USAID's five environmental focus areas in terms of number of projects and annual funding obligations. Funding for the tropical forest and biodiversity conservation program, which as of FY 1993 included 135 projects, rose at a 20 percent annual average rate from FY 1987 through FY 1991. This reflects the combined effect of the rapid start-up of the biodiversity component beginning in FY 1987 and strong, continued growth in forest



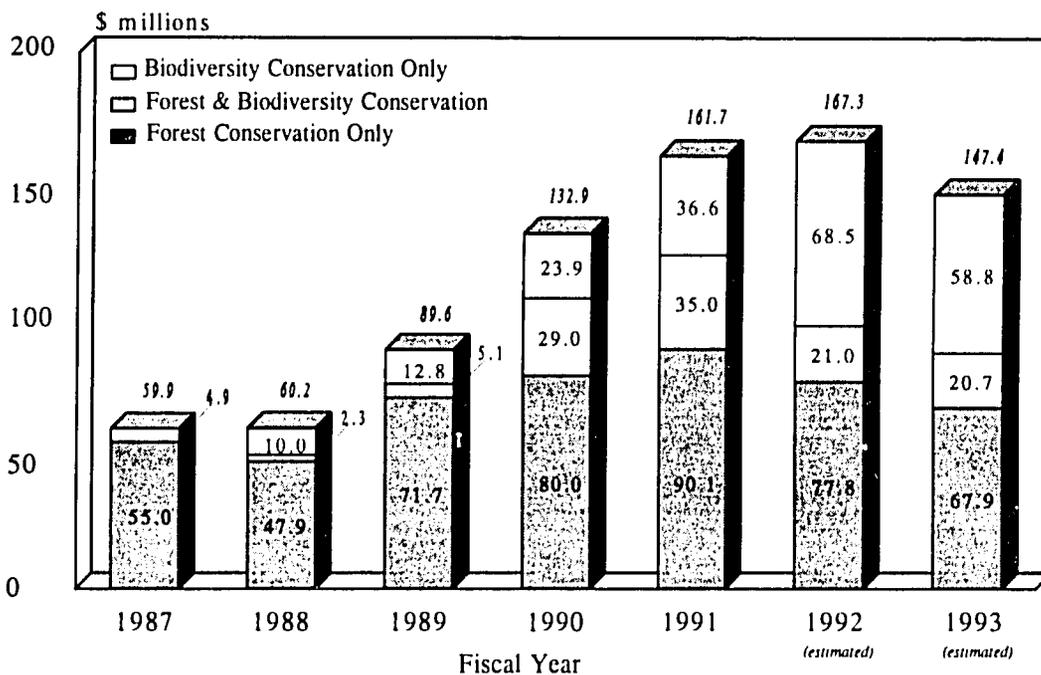
conservation activities. Growth peaked at \$167 million in FY 1992 and is projected to decline by 12 percent to \$147.4 million in FY 1993 (see figure 1.2). The forest conservation component declined in both FY 1992 and FY 1993 whereas the biodiversity component declined only in FY 1993. Reliable data on funding for FY 1994 and FY 1995 were not available at the time of this report's publication.

Box 1.4
One Obligation, Two Objectives:
Avoiding Double Counting of Funding Overlap

A single USAID project can often serve both tropical forest and biodiversity conservation objectives. For example, a full 100 percent of the USAID/Madagascar *Sustainable Approaches to Viable Environmental Management* project's \$4.0 million of FY 1992 funds is assigned to forest conservation, whereas 95 percent (\$3.8 million) is assigned to biodiversity conservation. Totalling the two would inflate the contribution to the combined portfolio by \$3.8 million. To account for this, ENRIC has defined an "overlap" category in which both tropical forest and biodiversity conservation objectives are met by a single obligation. As shown in figure 1.3, overlapping obligations in USAID's tropical forest and biodiversity conservation portfolio increased rapidly over FY 1988-91 with the buildup of the new biodiversity objective peaking at \$35 million, or approximately 20 percent of total combined funding. This overlap is projected to drop over FY 1992-93 as an increasing number of biodiversity projects that do not have forest management objectives come on-line.

Figure 1.3

Tropical Forest and Biodiversity Conservation Obligations (FY 1987-93)



Many USAID projects provide funding for biodiversity activities in forested habitats, thereby simultaneously supporting both biodiversity and forest conservation objectives. USAID's Environment and Natural Resources Information Center (ENRIC) has defined an overlap category to calculate those obligations that meet both biodiversity and forest conservation objectives (see box 1.4 above). In fact, overlapping obligations averaged over 18 percent of the combined funding for FY 1990-93.

Forestry funding. Forest conservation obligations, which peaked at \$125 million in FY 1991, declined by 21 percent (\$26.3 million) in FY 1992 and by another 10 percent (\$10.1 million) in FY 1993 for a total decline of 29 percent over FY 1991-93. It is important to note that funding obligations for FY 1992 and FY 1993 are estimates and, in the case of FY 1993, subject to substantial adjustments before figures are finalized. In addition, in interpreting funding trends, readers should remember that yearly obligations represent the amount of funds made available for use and not what is actually expended in the same year. In most projects obligations are unevenly distributed over the years during which a project is active. In the early years of a project, funding may be obligated well in advance of expenses, inflating the initial years' obligations at the expense of later years. For this reason, the true nature of funding trends can be masked by uneven flows of obligations.

A second reason that funding obligations fluctuate from year to year is that a few large projects account for a disproportionate share of funding in tropical forest and biodiversity conservation. The top ten projects, shown in table 1.1, account for 45 percent of all obligations for tropical forest and biodiversity conservation, averaged over the past three years. Sharp changes in obligations for these projects in a particular year, which may have little impact on activity levels, can result in a major impact on the portfolio's total funding level.

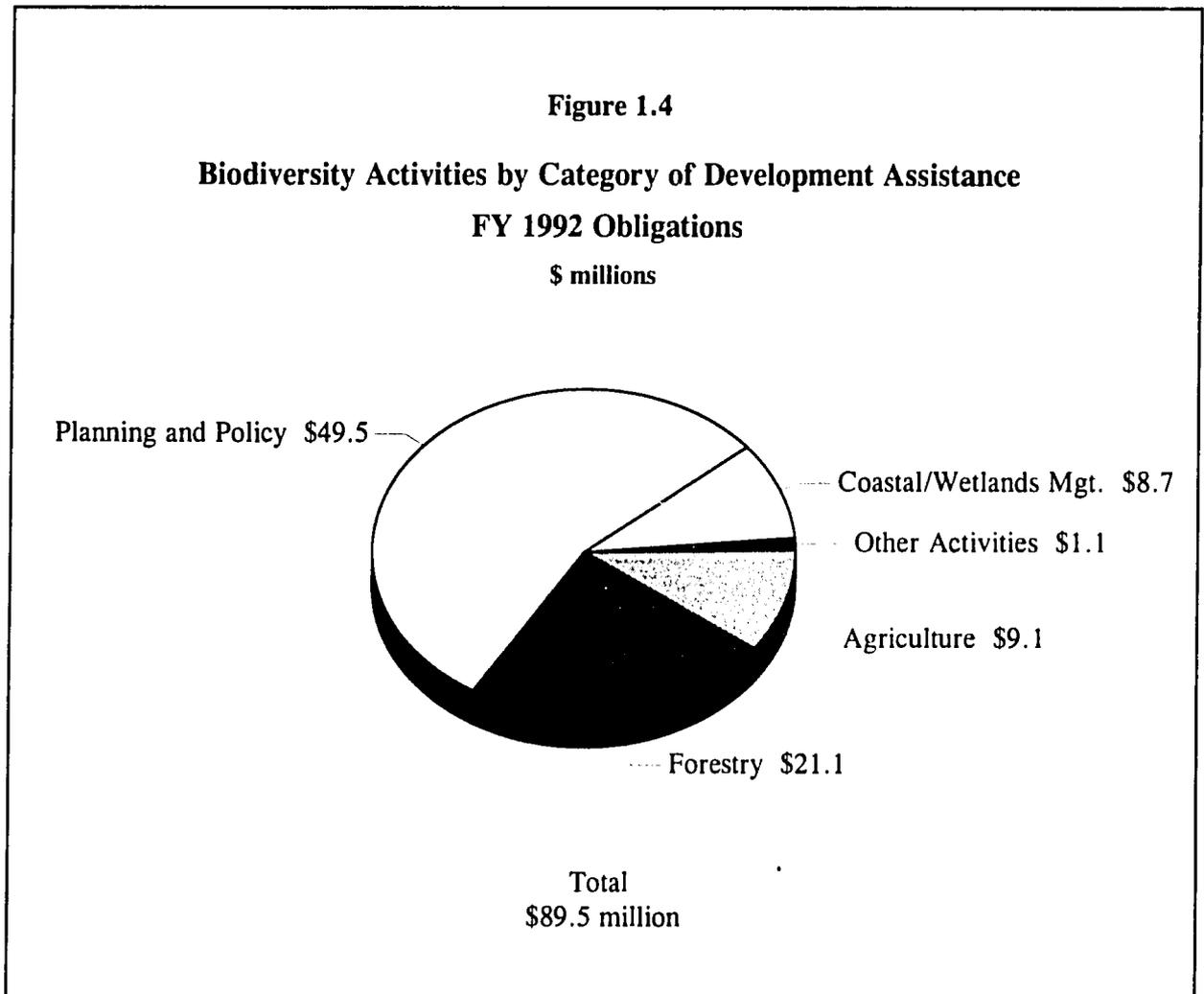
Table 1.1: Top Ten Projects in the Tropical Forest and Biodiversity Conservation Portfolio, FY 1991-93

Project Number	Title	Mission/Office	Obligations (\$000's)	
			Planned LOP ^a	Average Annual Obligations FY 1991-93 ^b
492-0444	Natural Resources Management Program	Philippines	125,000	27,900
687-0115	Knowledge and Effective Application of Policies for Environmental Management	Madagascar	27,000	7,700
936-4111.88	Consultative Group on International Agricultural Research	Support for International Organizations	C ^c	5,200
598-0784	Environment/Global Climate Change	Latin America and the Caribbean Regional	30,000	5,000
936-5554	Conservation of Biological Diversity	Environment & Natural Resources	40,000	4,800
525-0308	Natural Resources Management	Panama	15,000	4,800
687-0110	Sustainable Approaches via Environmental Management	Madagascar	40,000	4,700
690-0251	Natural Resources Management	Southern Africa Regional	38,000	4,000
521-0217	Productive Land Use Systems Project	Haiti	30,000	3,900
598-0782	Parks in Peril	LAC Regional	13,000	3,700

^a LOP = Life of project

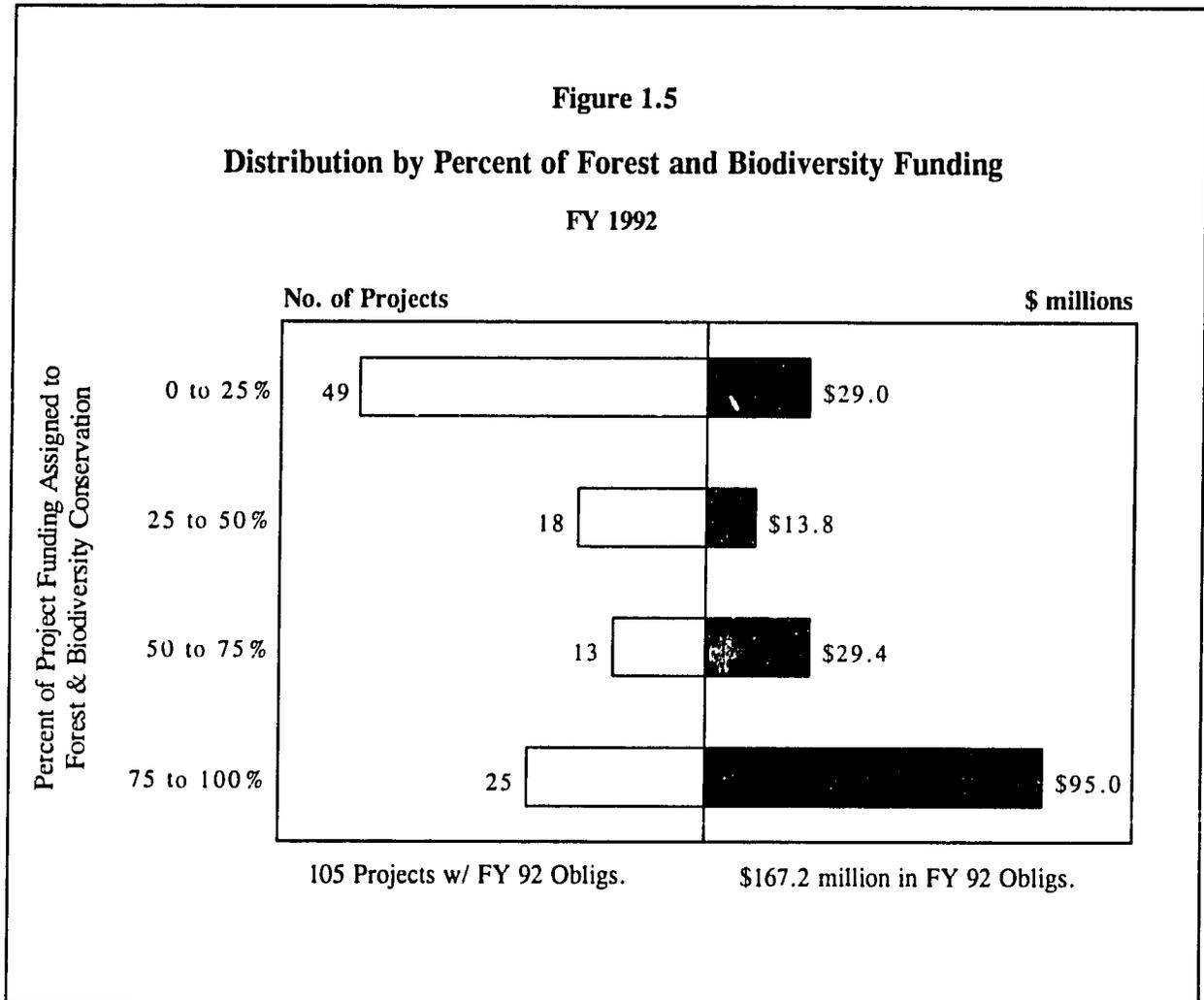
^b Average annual funding obligations are calculated by multiplying the percent that a project is coded tropical forest and biodiversity conservation by the project's total obligation for FY 1991-93 and averaging the result for the three-year period.

^c C = Continuing project (funding obligations determined on a yearly basis)



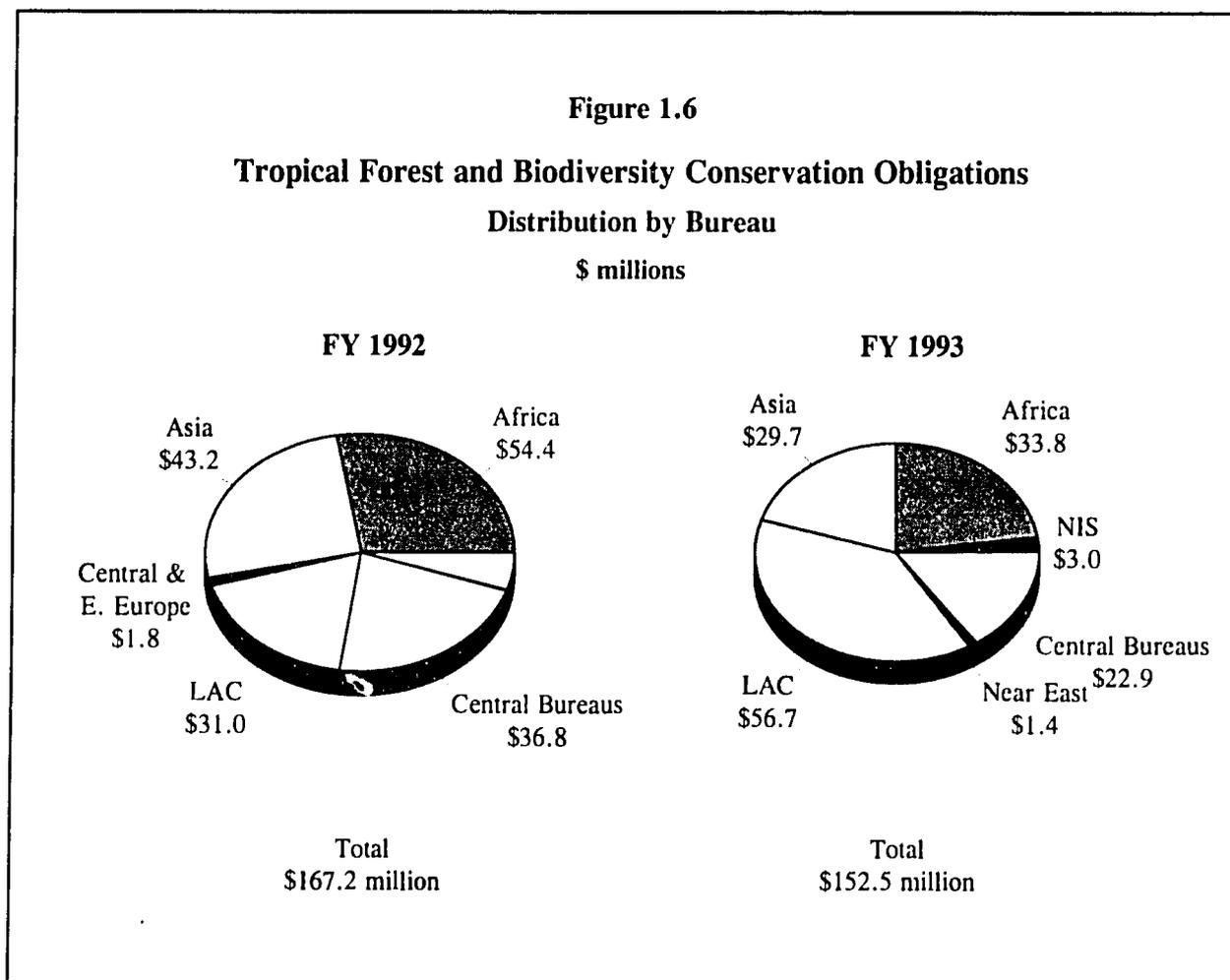
An important conclusion about this funding decline is that the annual average level of funding for the FY 1991-93 period for tropical forest conservation is about \$105 million and not the \$125 million to \$130 million range suggested by USAID's earlier budget planning projections.

Biodiversity funding. Since the Agency began biodiversity conservation activities in FY 1987, funding for this subsector has increased from \$4.9 million to \$68.5 million reaching



its peak in FY 1992. In FY 1993 funding for this subsector is expected to fall by 11 percent, or \$10.0 million, which is still 11 percent higher than FY 1991.

It is important to note that, as reflected in USAID's definition of biodiversity, not all of USAID's biodiversity activities take place in close association with tropical forest habitat conservation. As shown in figure 1.4, USAID's support for biodiversity conservation falls into four major categories of activity, the largest of which is related to planning and policy.



Forestry-related biodiversity activities account for about one-third of the total. Biodiversity conservation in coastal and wetland areas and biodiversity conservation for agricultural purposes are also important activities. Examples of all of these activities can be found in the report, especially at sections 2.3, 5.1.2, and 5.2.1.

Portfolio composition. Although ten large projects account for nearly half of the funds supporting forest and biodiversity conservation, the majority of projects contributing to the sector's activities had primary objectives other than tropical forest and biodiversity

conservation activities. To illustrate this point, in FY 1992, 64 percent of the 105 projects included in the portfolio counted less than half of their total funds obligated for that year to forest and biodiversity conservation (see figure 1.5). This reflects the growing trend toward integrating environmental activities among subsectors and between sectors.

Table 1.2: USAID Tropical Forest and Biodiversity Conservation Funding by Bureau, ^a FY 1992-93 (\$ millions)

Bureau	FY 1992 ^b (estimated)			FY 1993 (estimated)		
	Biodiversity	Forest	Total ^c	Biodiversity	Forest	Total
Africa	40.3	23.5	54.4	21.5	14.4	33.8
Asia	12.0	32.6	43.2	6.7	25.4	29.7
Latin America and the Caribbean	15.3	19.8	31.0	38.7	32.7	56.7
Research and Development	21.0	18.7	33.5	9.6	12.8	20.8
Other ^d	1.0	4.2	5.1	3.0	3.4	6.4
Totals	89.6	98.8	167.2	79.5	88.7	147.4

^a Appendix A describes methods used to compute environment strategy obligations.

^b FY 1992 figures are from the 1993 OYB; FY 1993 figures are from the 1995 ABS. Due to rounding, figures may vary +/- \$0.1 million.

^c Possible double-counting of overlapping obligations has been eliminated.

^d Directorate for Policy, Bureau for Food and Humanitarian Assistance, Bureau for Private Enterprise, Bureau for the Near East, Bureau for Europe, NIS Task Force.

Table 2.1: Estimates of Tropical Forest Cover Area and Rate of Deforestation by Geographical Subregion¹⁵

Geographic subregion/region	Number of countries	Land area	Forest cover		Annual deforestation 1981-90	
		million hectares	1980 million hectares	1990 million hectares	million hectares	% per annum
Africa	40	2,236.1	568.6	527.6	4.1	0.7
Asia & Pacific	17	892.1	349.6	310.6	3.9	1.2
Latin America & Caribbean	33	1,650.1	992.2	918.1	7.4	0.8
Total	90	4,778.3	1,910.4	1,756.3	15.4	0.8

The world's marine and coastal areas, including rich but fragile ecosystems such as coral reefs and mangrove forests, are also under enormous pressure. Such regions are home to about one-third of the world's human population¹⁶ and are experiencing even greater degradation than tropical forests.

Because of the rapid pace of tropical deforestation (see table 2.1) and the increasing disturbance of coastal regions, species are disappearing before they have been identified, eliminating any hope of understanding their functions in their habitats, their relationship to the rest of the ecosystem, or their potential utility to humans. In many cases, the loss of species, or even declining populations falling short of extinction, has wider ecological consequences. For example, in the past 20 years, the population of migratory birds returning to the United States from wintering in Latin America and the Caribbean has dropped by half, probably because of loss of habitat along the birds' travel route, including in the United States.¹⁷ This drop could impose new costs and management burdens on the U.S. agriculture and forestry sectors. Because birds are insect eaters, plant pollinators, and seed dispersers, their loss may necessitate greater use of chemical insecticides (which in turn could affect the health of remaining bird populations) and require other means of pollination to ensure plant reproduction.

2.1.1 The Value of Forests and Coastal Regions

The world's forests represent critical economic resources, supplying vital energy and such essential products as lumber, wood, and paper products. Forests are also a rich and varied source of nuts, fruits, gums, oils, flavorings, flowers, and medicines, as well as plants and wild animals (see box 2.1).

Worldwide, some 500 million people live in tropical forests;¹⁸ some 200 million are indigenous or tribal people.¹⁹ These forest land farmers and their families depend on forest fallow to restore cropland and to directly provide much of their livelihood. In addition, hundreds of millions of people around the world earn a living by extracting, processing, and marketing forest products. Forest products represent a substantial share of global trade, especially between tropical countries and industrialized nations in the temperate latitudes.

In addition, forests provide vital ecological functions, such as regulating the water cycle and contributing to water supplies, preventing soil erosion, slowing water runoff, and curbing flooding. For instance, a recent study in Costa Rica found that declining soil fertility, coastal siltation, and other consequences of tropical deforestation resulted in the loss, over a 20-year period, of Costa Rican economic output equivalent to one year's Gross Domestic Product.²⁰ Loss of tropical forests increases carbon dioxide in the atmosphere and may contribute to global climate change.

Similarly, mangrove forest and coastal wetlands are among the most productive ecosystems on earth, providing a number of vital and often overlooked functions, including filtering waterborne wastes, buffering the shore from severe storms, and housing large numbers of birds, fish, mammals, and plants. Mangrove forests provide overwintering spots for many temperate songbirds.²¹ Coastal wetlands serve as hatcheries for economically important fin fish and shellfish, yield timber for construction and charcoal, and produce medicinal plants and high-quality honey.

Box 2.1

The Economic Value of Biodiversity

By signing the Convention on Biological Diversity in June of 1993, President Clinton gave a clear signal that the United States fully recognizes the value of biodiversity and the role it can play in economic development. The cornucopia of plants and animals in a standing tropical forest represents a significant economic asset to developing nations. It provides environmental services, furnishes nontimber forest products, presents a reservoir of genetic diversity and offers the opportunity for ecotourism. These benefits can greatly exceed the value of extracted timber or conversion of forest for other common uses, including shifting agricultural cultivation, cattle raising or production through tree plantations. The value of standing forest has often been overlooked by development planners. Some economists, however, have begun to study the economic value of land left covered by forests, instead of being converted to other uses. Benefits are especially great in two areas:

Genetic diversity and medicine. Traditional medicine, commonly derived from plants, is the only form of health care available to four out of five people living in developing countries.²² One-fourth of all prescriptions dispensed in the United States contain active ingredients extracted from plants.²³ Aspirin, derived from willow trees, is a common example, whereas quinine, extracted from the bark of the neotropical *Cinchona* tree, was used for many years to treat malaria and continues to be used as the cure of last resort. Eucalyptus oil is widely used in cough drops.²⁴ Extracts from the neem tree, known for thousands of years in India for its insecticidal and medicinal properties, have been found to cure many types of ailments, including the fungus that causes athlete's foot and boils.²⁵ Worldwide, drugs based on plant-derived active ingredients are worth \$40 billion each year.²⁶ In addition, more than 500 identified marine organisms produce chemicals thought to hold potential for fighting cancer,²⁷ and the search for a cancer drug in tropical forests goes on worldwide.

Until recently the potential of tropical rain forests was of little benefit locally. That changed recently when the Merck Pharmaceutical Co. negotiated an agreement with Costa Rica's National Institute for Biodiversity (INBio) to study plant specimens collected by INBio's parataxonomists, who are trained with USAID support. Merck is searching for possible medicinal applications from Costa Rican rain forest plants. In addition to a one-million dollar payment, Merck will share royalties on successful products with INBio and the Ministry of Natural Resources, helping to finance local research and forest conservation. Indonesia, Mexico, Nepal, and Nicaragua are now studying this example.²⁸

Tropical forest products.²⁹ Worldwide, the market for nontimber forest products, including rattan, houseplants, and spices, is estimated at \$10 billion annually.³⁰ According to one study,³¹ a hectare of forest in Peru—the size of a football field—could yield an annual profit of \$6,820, after costs for harvesting, processing, and transportation under a sustainable

system of low-intensity harvesting of fruits, oils, rubber, and medicinal plants, and selective harvesting of timber. Timber extracted selectively on this hectare over 20 years would yield a total of \$490. If all the commercial timber were cut all at once, a one-time harvest would be worth \$1,000.

Insect predators and parasites found in tropical forests also provide valuable economic products and services, controlling at least 250 agricultural pests.³² Citrus growers in Florida, for example, save \$40 million each year by using parasitic insects from the tropics to control citrus tree pests.³³ Nontimber forest products worth \$120 million were exported from Indonesia in 1982, more than the combined exports of copper, aluminum, tea, and tobacco.³⁴ In The Gambia, a recent study noted that 13 percent of the cash income of farming households was earned by marketing nontimber forest products.³⁵ In general, money earned from nontimber forest products is distributed with greater equity than revenues from timber exports, which often yield few local benefits.

The combined economic value of nontimber forest products and forest ecological services provided by the forest is substantial and can greatly exceed logging as an economic activity. The economic value of La Tigra, a Honduran forest reserve, which provides 40 percent of the drinking water to the capital, Tegucigalpa, is estimated at \$100 million or \$13,300 per hectare.³⁶

2.1.2 Genetic Diversity and Food Crops

The genetic diversity found in the world's terrestrial, coastal, and marine regions of the tropics underpins another vital sector of the economy: agriculture. Of the estimated 250,000 species of higher plants, fewer than 250 are used in agriculture. Today, 30 species provide 95 percent of the world's food needs, and the majority of people live on fewer than 12 species.³⁷ Throughout history, people have eaten only 3,000 of the 75,000 edible plant species.³⁸

It is important to maintain the wild relatives of food crops to ensure future access to the gene pool that provides valuable traits such as resistance against insect pests, blights, and drought. Modern seed producers introduce new genes for disease resistance into commercial crops every five to fifteen years because pests and diseases are constantly evolving.³⁹ The

potato industry depends on genetic material found in the thousands of potato varieties of the Andes mountains in South America; corn growers depend on wild maize from Mexico, and barley farmers protect themselves from disease outbreaks with seeds originating in the Ethiopian highlands.

Wild relatives of cultivated plants also can improve the hardiness and adaptability of plants. A search is on in the mountains of Pakistan, for example, for frost-resistant varieties of the multipurpose neem tree for use in cooler climates. Also, certain wild relatives of wheat, rice, barley, millet, sorghum, beets, and tomatoes grow well under saline conditions and can be bred for use in the nearly ten million square kilometers of soils contaminated by salt around the world, yet with the exception of wheat, tomatoes, and potatoes, fewer than 2 percent of the wild relatives of major crops are currently protected in seed banks.⁴⁰

USAID plays a key role in supporting basic and applied research in the area of genetic diversity and food crops. USAID helps finance and is represented on the governing boards of many international agriculture research organizations. As the coordinator of U.S. interactions with the Consultative Group on International Agricultural Research (CGIAR), USAID helps international agriculture centers establish research priorities and allocate resources, which have increasingly been focused on environmentally sustainable agriculture, including maintenance of wild relatives of important crop species.

2.2 Losses of Biodiversity through Deforestation

Deforestation leading to loss of biodiversity is a problem of global importance, but is caused locally through the daily actions of millions of individual resource users. Their decisions may arise from traditional knowledge or beliefs; the demand for goods and services; tenurial or customary resource use arrangements; market opportunities; and the effects of cultural, religious, institutional, or legal restrictions on individual behavior. From the individual

perspective these resource use decisions are rational, but in many cases it is doubtful whether they represent the best outcome for society as a whole.⁴¹

The underlying cause of much of the world's deforestation—land hunger—can result from social problems such as inequitable land and resource tenure systems, as well as population growth. In addition, inappropriate policies and programs for managing forests—including methods of allocating forest timber concessions, forest fees inadequate to cover management costs, and undervaluing natural resources by economic planners—can all produce short-term attitudes resulting in the unnecessary destruction of these assets.

Moreover, economic stagnation in many developing countries places increasing pressures on protected areas to provide resources for surrounding communities and to generate income for national treasuries. In response, some governments have granted oil exploration permits and logging concessions in national parks and are often unable or unwilling to suppress local activities such as poaching or illegal harvesting of fuelwood. Limited government resources and inappropriate management systems also contribute to the problems of basing conservation strategies on protected areas.

Other major causes of biodiversity loss include destructive logging, uncontrolled fires, and agricultural policies favoring land clearing. Roads, railroads, and hydroelectric dams tend to accelerate deforestation, both during and after construction. New roads and railroads provide access to forests and stimulate increased human pressure and colonization along access routes.

Another major factor is population pressure. Many tropical countries, particularly in sub-Saharan Africa, are experiencing high rates of population growth. Even though a downward trend has been detected in other developing areas of the world, total population levels are expected to continue growing for many years to come.

Many analysts now believe that population growth is both a cause and a consequence of development problems in tropical areas. This view is reflected in USAID's strategy, which includes population programs in many developing countries. Rather than treating population growth as an isolated issue, USAID programs focus on population as one of several areas in which to carefully define and implement national development strategies that can bring tangible benefits to the lives of lower income groups. Improved economic performance and social equity could be among the most effective strategies for reducing today's unsustainable population growth rates.

2.3 How to Bring These Losses under Control

The loss of tropical forests might be reduced by 40 percent through a strong conservation program to maintain existing forests and to increase tree cover through farm forestry and through natural regeneration and reforestation on already deforested land.⁴²

Many of the measures necessary to curb current rates of deforestation and biodiversity loss in developing countries do not require radical changes in economic objectives. Rather, they call for changes in the policies, subsidies, and incentive structures that stimulate unsustainable resource exploitation and contribute to environmental degradation. Better planning and management of forest resources and protected areas, appropriate tenure and investment policies, and a longer-term perspective on resource exploitation could go far toward mitigating some of the trends now threatening the stability of tropical forests and other ecosystems that harbor biodiversity. Some of the technical approaches that USAID is pursuing are described below.

2.3.1 Improved Forest Management

With appropriate protection and silvicultural practices, tropical zone forests in wet or dry climates can regenerate naturally. Fire must be avoided for several years, a seed source must exist nearby, populations of seed dispersers must be protected, and the land must be left

relatively undisturbed; these are the basic principles behind the long-term fallowing of land. For instance, in Peru a USAID-funded pilot project in natural forest management in Palcazu utilizes these natural forest regeneration principles to sustainably supply a timber-processing cooperative.

Tropical forests have regenerated naturally in several well-documented cases: in Puerto Rico, since World War II, as the children of farmers have taken up alternate occupations in towns or cities or migrated to the U.S. mainland, many former farmlands are once again forested. Similar processes took place in Panama after the construction of the Panama Canal, and in Kenya, areas completely deforested at the turn of the century were abandoned when people were stricken with sleeping sickness. These areas are again thickly forested today.

Natural regeneration and water-harvesting techniques used in semiarid Niger in the USAID-funded *Forestry and Land Use Planning* (FLUP) project have also established that the introduction of exotic species is not necessary to boost growth and yield rates. The FLUP project showed that, if properly managed, a degraded natural forest area can regenerate itself and support income-producing enterprises for local residents, even in arid and semiarid areas.

USAID supports natural forest management around the world, including pilot projects in natural forest management, such as the Plan Piloto in Mexico and the Forest Conservation and Management Project (BOSCOSA) in Costa Rica (see p. 162), and natural regeneration in the Philippines (see p. 122) and in Guanacaste National Park in Costa Rica.

2.3.2 Protecting Tropical Forests and Biodiversity

Efforts to protect forests and biodiversity have long depended on the creation of national parks and nature reserves, yet it is increasingly recognized that, for a variety of reasons,

Box 2.2

Changing Local Attitudes toward Forest Destruction

Destruction of tropical forests is often understood to stem from poverty: the rural poor have little choice in how they treat the environment. This view is now being challenged by recent experiments to interest rural people in conservation of their natural environment. A successful campaign to return captive-raised golden lion tamarins—small primates about the size of squirrels—to the wild in Brazil's Atlantic forest illustrates that attitudes and motivations of rural people can be a positive factor in conservation.

Under a program sponsored by the Smithsonian Institution's National Zoo and World Wildlife Fund, Brazilian farmers agree to leave half their acreage in natural forest instead of clearing and burning it—with generous media coverage of the event. The prestige associated with this program has generated intense local interest, and there is now a waiting list of farmers who wish to participate. Local attitudes toward conservation have quickly shifted, a development clearly evidenced in 1990 when villagers turned out in large numbers to quell a forest fire that had spread into the tamarin reserve; previously, such fires provoked little, if any, response.

This program has shown that burning the land is not only driven by necessity but also by habit and that the attitudes of local people can be changed, provided that they perceive that it is in their interest to change. Significantly, benefits need not be only monetary: A sense of pride and responsibility for unique aspects of their environment may be a powerful motivation for people to practice conservation at the local level.

conservation cannot depend on a strategy of protected areas in which human activity is prohibited. For example, many such areas are limited in size and may not represent stable, functioning ecosystems whose future can be assured, especially as human pressures build around their peripheries.

It has been shown, however, that when rural communities perceive tangible benefits from protected areas, they will help to protect these resources—for example, by helping to

reduce poaching and illegal logging by outsiders (see box 2.2). In southern Africa, USAID's *Regional Environmental and Natural Resources Management* (RENARM) project provides benefits from wildlife utilization directly to villages and compensate them for crop damage caused by park utilization directly to villages and compensate them for crop damage caused by park animals. As local residents begin to see that their coexistence with wildlife need not jeopardize their livelihoods, and as they begin to share in the revenues produced by tourism and safari hunting, local attitudes and behavior are shifting to favor parks (see p. 102).

Another important change is recognition of the ecological value of land located outside the boundaries of parks and reserves. "Green zones" along riverbanks and wildlife corridors between parks can provide wildlife habitat without the need to create new parks. Such areas provide a sustainable supply of nontimber forest products for local residents, and expand the habitats and migration corridors for wildlife, even adjacent to logged areas or farmland.⁴³ Corridors could be used to enhance conservation opportunities significantly, especially in countries where land pressure precludes the creation of new parks.

By linking larger protected areas with a chain of smaller but ecologically important patches of forest, USAID is pursuing an approach that builds ecologically sound conservation programs on existing and culturally accepted land uses. In Central America USAID's RENARM project has proposed linking the major protected areas and rivers with forested wildlife corridors, in a program dubbed "Paseo Pantera" or "Path of the Panther" (see p. 152).

2.3.3 Nondestructive Economic Uses of Forests

USAID is also supporting a number of initiatives to protect tropical forests and biodiversity through nonconsumptive uses such as nature-based tourism, hiking, photography, and bird-watching in projects such as the Maya Biosphere Natural Resources Management Project in Guatemala (see p. 158), the Natural Resource Conservation and Historic Preservation project

in Ghana (see p. 96), the Natural Resource Management and Protection (NRMP) project in Belize (see p. 145), the Knowledge and Effective Application of Policies for Environmental Management (KEAPEM) project in Madagascar (see p. 94), the Conservation of Biodiverse Resources (COBRA) project in Kenya, and the Parks in Peril project in Latin America (see p. 160). Nature-based tourism worldwide generates revenues of up to \$12 billion per year⁴⁴ and represents one of the fastest-growing segments of the international travel and tourism industry (see box 2.3).

USAID is also supporting nontimber forest use. Through a \$3 million line of credit to Cultural Survival Enterprises in FY 1991, marketing mechanisms are being developed to promote trading of forest products, such as nuts, fruit, oils, and essences—all obtained using sustainable management techniques. Other USAID-funded projects implemented by Conservation International are helping to improve harvesting and marketing techniques of nontimber forest products (see box 2.1, p. 38). The \$4.4 million Profitable Environment Protection (PEP) project also promotes economic growth, while maintaining the ecosystem in the South Pacific. USAID is providing ecological and technical assistance to private and community-based groups in the region to select environmentally sustainable enterprises (see p. 129).

2.3.4 Choosing Priorities for Protection

An unprecedented biodiversity effort in Brazil is developing tools to choose priority sites for intervention. Biologists at a USAID-supported biodiversity workshop in January 1990 identified the locations of the highest concentrations of particular species and also identified priority sites for protection. Seven maps produced by different teams of specialists were superimposed to identify areas in which needs and priorities overlapped. The resulting map indicated the highest priority areas for protection in the contiguous countries of the Amazon Basin.⁴⁵ This map will be used by government planners, conservation organizations, and others concerned with natural resource management and conservation initiatives in the

Box 2.3

Nature-Based Tourism

One of the tourism industry's fastest-growing segments is nature-based tourism, or "ecotourism." Tourism in developing countries reached \$55 billion in 1988, of which an estimated \$2 billion to \$12 billion was generated by visits to natural areas.⁴⁶ Nature tourism is now the top foreign exchange earner in Kenya and Nepal, ranks second in Rwanda, and holds third place in Costa Rica.⁴⁷

Market analysts expect this trend to accelerate as middle-aged "baby boomers" seek increasingly novel vacation destinations. Adventure travel to Costa Rica grew at an annual rate of 50 percent during the 1980s; some tour operators had to turn clients away while many conventional beach resorts operated below capacity.⁴⁸ Travelers to ecotourism destinations are often willing to pay substantial entrance fees when such funds are applied toward maintaining the site in its natural state and covering the costs of educational materials.⁴⁹

Nature-based tourism is an attractive proposition for many financially pressed developing countries. Local resistance to setting aside large tracts of land for protected areas may be softened by the prospect of income and jobs generated by an ecotourism industry. Entry fees can help make a nature park self-supporting, and tourist expenditures for food, lodging, guides, transportation, and souvenirs provide income and employment for rural residents.

Planners expect that such benefits will provide a strong local incentive to protect lucrative natural assets; however, in some cases, these have not been sufficient to halt resource degradation. In Mexico's monarch butterfly reserve, for example, tourism benefits have not been distributed evenly within the local community; as a result, illegal logging in the reserve has not slowed.⁵⁰

Not a panacea. Moreover, in many cases, nature-based tourism has proved more difficult to establish than initially expected. For example, remote, inaccessible sites continue to inhibit the development of Madagascar as an ecotourism destination on the scale of the safari parks in Kenya or the Himalayas in Nepal.⁵¹ Concerns about political stability can also present difficult obstacles for would-be tourism destinations in the highly competitive international marketplace. In general, attracting a steady volume of tourists depends on ease of transportation and access, the standard of accommodations, and the special characteristics of local animals and scenery.

USAID's activities. To succeed, nature-based tourism requires careful planning and management. USAID promotes nature-based tourism in many of its current tropical forestry and biodiversity projects, including the Natural Resource Management and Protection project in Belize (see p. 145) the Conservation of Northern Forests project in Congo (see p. 106), the Natural Resources and Historic Preservation project in Ghana (see p. 96), the Maya Biosphere Natural Resources Management project in Guatemala (see p. 158), the Conservation of Biodiverse Resource Areas in Kenya, and the Parks in Peril program in Latin America (see p. 160).

Ecotourism is also an important component of the Environment and Global Climate Change (E/GCC) project in Mexico (see p. 148), the \$80 million natural resource conservation program in Madagascar (see p. 94), the Natural Resources Management Program in the Philippines (see p. 122), the Action Plan for the Environment (APE) project in Uganda (see pp. 15 and 95), the U.S.-Asia Environmental Partnership (US-AEP) project throughout Asia (see p. 120), the Southern Africa Development Coordinating Committee (SADCC) Regional Natural Resource Management project in southern Africa (see p. 102), and the Wildlands and Human Needs Program (WHNP) Africa-wide (see p. 64).

In addition, USAID is supporting a series of studies on ecotourism. Two USAID-backed studies in FY 1992 highlighted problems with ecotourism. The first found that income generated through ecotourism generally bypassed local communities, flowing instead to national treasuries. Revenues from entry fees and other tourism expenditures in popular locations far exceed park management budgets and yet are seldom applied toward operational costs. Permanent employment of local residents has also been insufficient in many cases to gain the popular support and local goodwill initially envisioned by promoters.⁵²

The second study concluded that visitors should be educated about responsible ecotourism.⁵³ The staff also concluded that planners need to carefully assess three aspects of each park's carrying capacity: the ecological capacity of the environment to sustain visitation without negative impacts; the tourists' social capacity, which measures visitor dissatisfaction with overcrowding and environmental degradation; and the hosts' social capacity, beyond which local residents tire of tourists and attitudes toward travelers become less friendly.⁵⁴

Other USAID-backed studies have been completed on the ecological impacts of tourism in Kenya's Masai Mara National Reserve. The proceedings of a workshop on tourist attitudes and the impact of various tourist activities in the reserve have also been published. Two other studies are under way for the Africa Bureau. One focuses on low-impact tourism as a strategy for sustainable development. The other analyzes the impact of tourism on natural resources and economic development and presents guidelines for USAID projects.

Amazon region, marking the first time such a planning tool has been available for this purpose.

2.4 Making a Difference

Although the challenges of conserving tropical forests and the biodiversity they contain are formidable, USAID is carrying out a variety of programs that are already making a difference on the ground. In coordination with other donors, host country governments, and local communities, USAID is working to achieve a balance between sustainable use and resource protection, with brighter prospects both for the people living in rural areas and for maintaining the diversity of plants and animals that share the planet with humans.

The following chapters discuss USAID's ongoing project activities, their progress in FY 1992, and projected plans and new initiatives for FY 1993.

Chapter 3

Centrally Funded Programs

To promote the conservation and management of tropical forests and biodiversity, a number of centrally funded USAID projects advance applied research, provide technical assistance to USAID missions and developing country governments, and strengthen local groups, nongovernmental organizations (NGOs), and other environmental institutions. These projects, managed by USAID's Bureau for Research and Development (R&D), which as of August 1993 was reorganized as the Bureau of Global Programs, Field Support, and Research (G Bureau), operate at the country or regional level and at the global level.

At the country or regional level, the R&D Bureau has been instrumental in developing a new generation of USAID projects in tropical forest and biodiversity conservation. The Bureau links missions with technical expertise from the U.S. Forest Service, National Aeronautics and Space Administration, and other U.S. government agencies; provides access to a pool of experienced specialists in disciplines such as natural resource management, conservation biology, and local governance; and provides access to current thinking on policy and management approaches to sustainable development.

At the global level, the R&D Bureau, in conjunction with USAID regional bureau staff, provides technical representation in international bodies concerned with deforestation and the loss of biodiversity around the world, particularly the Global Climate Change program, the Tropical Forestry Action Program, the G-7 Pilot Program to Conserve the Brazilian Rainforest, and the United Nations Education and Scientific Organization (UNESCO) Man and the Biosphere Programme.

The R&D Bureau also supports or actively participates in research initiatives relevant to tropical forest and biodiversity conservation. The Bureau funds biodiversity research, managed by the National Science Foundation, the National Institutes of Health, and others, and plays a key role in establishing research priorities and allocating resources for important new activities as the coordinator of U.S. government interactions with the Consultative Group on International Agricultural Research (CGIAR). For example, the Bureau is supporting the establishment of a new international forest research center to focus on sustainable forest management and policy and supports small grants for diverse research, both basic and applied. The Bureau also provides core funding for the International Board on Plant Genetic Research.

The centrally funded projects described below fall into three broad categories: tropical forestry and agroforestry, biodiversity conservation, and environment/natural resource management.

3.1 Tropical Forestry and Agroforestry Projects

USAID efforts in tropical forestry support such activities as the development and promotion of agroforestry techniques, better means of reforestation, improved management of natural forest areas, and more efficient use of fuelwood resources. The projects described below include USAID's longest-running project in this sector, *Forest Resources Management* (FRM) (FY 1980–2000).

3.1.1 Forestry/Fuelwood Research and Development

Enhancing adoption of forestry research and technology in Africa, Asia, and Latin America has been the aim of the ten-year, \$24.6 million *Forestry/Fuelwood Research and Development* (F/FRED) project implemented by Winrock International in Asia and the International Council for Research in Agroforestry (ICRAF) in Africa. Initiated in FY 1985, the effort:

- improves research on forestry/fuelwood and agroforestry matters,

- supports the development of Asian and African regional networks of scientists and institutions working with multipurpose tree species, and
- develops national networks that coordinate with the farming community and local and regional networks.

The project's findings are helping to facilitate the rehabilitation of degraded forest land; such efforts will reduce pressure on natural forests and aid conservation of existing forests and their environments as well as meeting the needs of indigenous people living in and around these forests.

To reach global audiences interested in research on multipurpose tree species, F/FRED backs an information dissemination program. The effort supports a quarterly newsletter and has developed an information system that includes a modeling package and abstracts on research literature, as well as information on tree species trials and soil and climate data bases. As part of this program, the project supports a quarterly newsletter entitled *Farm Forestry News*. F/FRED has developed a comprehensive set of 80 publications, 18 of which were published in FY 1992.

In Africa, F/FRED has supported the East Africa Agroforestry Research Network for Africa (AFRENA) since the network's establishment under ICRAF auspices in FY 1986. The network's research demonstrates ways in which farmers and research workers can use trees and shrubs to improve soil fertility, reduce soil erosion, increase production of high-quality fodder, and increase production of fuelwood and other wood products.

Through on-farm trials, AFRENA field-tests a variety of agroforestry technologies. An evaluation performed in July 1992 found that AFRENA has made substantial progress in this area over the past six years. Moreover, the process developed by AFRENA for conducting on-farm research has proved successful. Both men and women farmers are recruited to demonstrate and explain the technologies and are provided with seedlings and follow-up technical assistance.

In Asia the project has concentrated on enhancing the capabilities of forestry research scientists. For example, since the project's beginning, F/FRED has financially supported attendance by hundreds of participants at courses on fuelwood and multipurpose tree species research and has backed six Ph.D. students conducting research in the United States.

F/FRED has developed networks of scientists and institutions involved in assessing, improving, and managing multipurpose tree species research. For example, in FY 1986 the project established the Multipurpose Tree Species Research Network to better meet the needs of small-scale farmers for both wood and nonwood products. This network has grown significantly and now comprises 34 institutions in 11 Asian countries.

3.1.2 Forest Resources Management II

Forest Resources Management II (FRM II) is USAID's flagship project to support forestry worldwide. Begun in FY 1991, this nine-year, \$25 million effort provides technical assistance, information, and training to USAID missions, U.S. Peace Corps Volunteers, host country agencies, PVOs, and NGOs. The project is an example of collaboration between U.S. government agencies, since most of the project's funds are used to support USAID field activities in developing countries through separate interagency agreements with the U.S. Forest Service and the U.S. Peace Corps. A smaller component is exploring support for private-sector, forestry activities.

FRM II is a follow-on to the successful, ten-year *Forest Resources Management* (FRM) project, USAID's first centrally funded, technical support project in forestry, which was completed in FY 1991. The initial FRM project was an important catalyst in the fivefold growth (from \$27 million in FY 1981 to \$125 million in FY 1991) of USAID's forestry programming. FRM II is building on this track record with an expanded Forest Service program, adding new areas of endeavor identified as on-the-ground needs by USAID (such as social forestry, natural forest management, and land-use planning/geographic information systems).

U.S. Forest Service. Since FY 1980, USAID and the U.S. Forest Service (USFS) have worked together to support international forestry efforts, first through FRM I and then through its follow-on, FRM II. More than 12 years of USAID support and effective collaboration between the two agencies have resulted in a greatly expanded, experienced, and effective International Forestry (IF) office at the Forest Service. Today the service implements a broad range of international forestry efforts worldwide, particularly in tropical forestry (see box 3.1). The Forest Service provides USAID ready access to a wide range of forestry technical assistance embodied in its nationwide professional staff.

A second-year evaluation of FRM II in late 1992 found that the project is fulfilling its goals and purposes and recommended an increase in budget. The study further suggested that the project's focus be expanded to include not only tropical and subtropical forests but also boreal and temperate forests (for example, in Central and Eastern Europe and the New Independent States of the former Soviet Union) and increase private sector activities in countries that request them. In FY 1993, IF began to collaborate with USAID under FRM II on activities in the New Independent States and Central and Eastern Europe, an effort that constituted the first use of USAID funds for natural resource management in the region. This has expanded the scope of cooperation with the Forest Service, which has strong expertise in temperate and boreal forestry.

Activities under FRM II are organized into four areas: technical assistance and training, service and support, private enterprise development, and facilitation of donor collaboration.

Technical assistance and training. At this time, technical assistance and training constitute most of IF's work through FRM II. This support comes through IF's *Forestry Support Program (FSP)*, whose staff are now merged with IF's Operations' staff. In FY 1992 USAID missions in 24 countries received 113 technical consultations through the project, and more than 30 countries obtained on-site assistance. For example, in the Philippines the project

Box 3.1

USAID Nurtures International Forestry at the U.S. Forest Service

Since FY 1980, USAID has played a major role in promoting international forestry work at the U.S. Forest Service (USFS). With USAID support, the USFS's International Forestry (IF) staff has grown from five to nearly 60 foresters, agroforesters, economists, planners, forestry education specialists, and others. Twenty of these professionals are funded or co-funded by USAID through its *Forest Resources Management II* (FRM II) project.

Early in the development of its tropical forest conservation program, USAID decided to draw on the expertise of the USFS and approached the U.S. Department of Agriculture (USDA) about establishing a technical services unit within IF's then small staff. Supported under USAID's *Forest Resources Management* (FRM) project—a ten-year, \$15.8 million project begun in FY 1980—IF's Forestry Support Program (FSP) flourished. A number of its activities evolved into such free-standing efforts as the Disaster Assistance Support Program, the International Forestry Seminar, and the Environment and Natural Resources Information Center.

In FY 1990 Congress upgraded the IF staff to a "major mission" of the USFS. This placed international forestry on a par with traditional USFS activities, such as forestry research and cooperation with state and private foresters—a historic reorganization of the USFS at the highest level of the agency. In FY 1992, for the first time, Congress specifically appropriated funds for IF's international forestry work. IF's Tropical Forestry Program (TFP) is implementing programs addressing climate change, loss of biological diversity, and tropical deforestation. In its mandate, Congress assured compliance of international activities of the USFS with U.S. foreign policy and close coordination with USAID mission priorities. TFP has built and supported partnerships with more than 50 international organizations, leveraging an additional \$12 million in funds for these programs. TFP activities emphasize technical assistance provided by USFS staff and training and support to international organizations.

In FY 1992, TFP funded 65 projects around the world to combat deforestation at a cost of \$3.5 million, matched by \$3.7 million from its partners. Activities ranged from training specialists in tropical countries in the use of remote sensing for forest inventories to collaborative agroforestry programs with the Peace Corps. Many TFP projects were carried out jointly with USAID, complementing USAID project funds.

Until early 1993 USAID-funded forestry activities at the USFS were undertaken by FSP; however, to update its organizational structure and better implement its growing international forestry program, the USFS merged FSP, TFP, and other functions into a combined IF Operations (IFO). Although former FSP staff will continue to serve FRM II objectives, additional IFO employees are expected to provide an even greater range of services to USAID—a fitting evolutionary step in this long-standing partnership.

helped the USAID mission plan for protection and management of the Subic forest and watershed. This work continued in FY 1993 through contributions of aerial photography interpretation, vegetation mapping, and technical assistance with resource management planning and data collection. In Panama the project sent a legislation and policy specialist to review proposed forestry legislation and testify at a government hearing. The project will also help develop a legal framework for sustainable management of Panama's natural resources.

Under FRM II, IF has continued to shift its emphasis in agroforestry from promotion to technical assistance and evaluation. For example, the project supported publication of a book and sponsored a state-of-the-art workshop on the economic analysis of agroforestry. The workshop, which was held in Bangkok, Thailand, in February 1993, was attended by 25 Asian agricultural extension project managers. In addition, FSP prepared the *Directory of International Training and Educational Opportunities in Agroforestry* and revised and republished the Spanish-language textbook *Sistemas Agroforestales*.

FRM II emphasizes assistance to the Peace Corps and other organizations that undertake natural resource activities, including PVOs and NGOs. Examples in FY 1992 include pre-service training in the Philippines, in-service training in Chile, and stateside training for Peace Corps Volunteers going to Senegal. Jointly funded with the Food Aid Management (FAM) group—a consortium of food-aid PVOs, the World Food Program, and the USAID Office of Food for Peace—FSP helped the consortium identify natural resource management issues and priorities. From this work, FAM published the report *Food Aid in Africa: Issues Affecting PVO Natural Resource Interventions*.⁵⁵ IF plans to build on these efforts by increasing the level of support provided to the Peace Corps and to USAID's work with NGOs.

In FY 1992 FRM II training activities worldwide focused on a range of topics, including women in development, integrated pest management, forest road maintenance, agroforestry, forest resource marketing, environmental impact assessment, and natural resource extension programs. The project supported the Ninth Annual Seminar on Forest Administration and Management at the University of Michigan and the first Seminar on Specialized Topics in Multiple Use Forestry, held in Florida and Puerto Rico and attended by senior forest managers from developing nations around the world. In addition, workshops in Guatemala, Mali, and Pakistan promoted the integration of women into development activities in the forestry sector. FRM II also supported the second Regional Workshop on the Conservation and Management of Afromontane Forests, held in Burundi in July 1992 and jointly funded with the USFS's own Tropical Forest Program.

FRM II supplied funds and personnel to assist in the design, development, and presentation of ten training activities. The targeted audience was field-oriented managers responsible for technology implementation. Participants also included policymakers, extension agents, and workers who planted trees and tended nurseries. Total FY 1992 attendance exceeded 150, including observers and instructors.

Service and support. FRM II provides USAID with numerous services, including an International Skills Roster of professionals with expertise in forestry and other environmental fields, studies of USAID's efforts in forest resource management, and technical reference services, including publications, reports, and reprints of forestry literature. FSP, through its widely circulated annual reports, quarterly memos, and periodic reports to USAID, has developed a significant "institutional memory" of USAID forestry and related natural resource management activities. Through a brown-bag seminar series, FSP has provided opportunities for dozens of individuals to address the environment and development communities in Washington, D.C. These seminars also provide a forum for active

interchange among representatives of various Research and Development/Environment and Natural Resources (R&D/ENR) projects.

IF's International Skills Roster gives USAID and its cooperating development agencies access to a broad range of advisors and project personnel in forestry, natural resources, and the forest industry. In FY 1992 the roster grew by nearly 400 to about 3,000 individuals and was utilized 157 times. Requests are primarily concerned with natural resource management, environmental assessment, and land-use planning. The roster is advertised widely and is open on a voluntary basis to individuals from the private and public sectors.

Private enterprise development. In FY 1992 the Forestry Private Enterprise Initiative (FPEI), implemented by the Southeastern Center for Forest Economics Research (SCFER), initiated activities in (1) income, employment, and pricing in tropical forest ecotourism, (2) enterprises and extractive reserves, and (3) the economics of agroforestry enterprises. SCFER, a joint program of Duke University, North Carolina State University, and the USFS, applied insights gained in past FPEI research to evaluate ecotourism alternatives for the Atlantic Coastal Forest in Brazil. The program continued work on constructing financial and economic models of extractive reserves and field-testing them in USAID countries. SCFER also completed a review and annotated bibliography of 72 recent publications on agroforestry economics and began developing a framework to assess the social impact of agroforestry projects.

Facilitation of donor collaboration. With increasing world attention on the loss of biodiversity and tropical forests, organizations and donors have responded with a range of projects. These efforts sometimes overlap and work at cross-purposes, reducing their effectiveness. The necessity of coordination among donors to resolve these problems is increasingly recognized. Under FRM II, USAID and the USFS initiated in FY 1992 a

number of activities to seek out and respond to opportunities for coordination among donors. These activities also link USAID and the USFS in exchanging information on international initiatives, such as the International Tropical Timber Organization (ITTO), the World Bank's Global Environment Facility, and the Tropical Forestry Action Plan. Activities in donor coordination include:

- organizing and facilitating a meeting of representatives of conservation projects in the Maya forest region, which extends from southern Mexico into northern Guatemala and Belize, to discuss common goals in conserving the region's biodiversity and tropical forests (the group's conclusions were published in a report entitled *Maya Forest: Key Issues and Recommendations for Action*);
- assessing the institutional capacity of Panama's Kuna Indians to carry out a proposed ITTO project to develop an integrated natural resource management plan;
- facilitating a workshop in Bethesda, Maryland, to identify gaps in international forestry policies, funding, and assistance activities (this workshop attracted 60 representatives of U.S. government agencies, donor organizations, and countries involved with natural resource management and forest and biodiversity conservation projects); and
- helping to identify potential ITTO projects in Ecuador at the request of the USAID mission there and to facilitate communication between the World Bank, USAID, and the USFS on developing joint projects (these projects are aimed at conserving biodiversity and developing sustainable management forest practices, particularly in the biologically rich area of northwestern Ecuador).

Identification of private sector opportunities. In addition to its support to the USFS and SCFER, FRM II is identifying joint private enterprise opportunities in forestry and natural resource management between the United States and developing countries. During FY 1992 the project helped identify specific market and business opportunities for wood and nonwood, forest-based products and services in support of improved forest management and

conservation initiatives. FRM II completed fieldwork in Bolivia, Ecuador, and Mexico in collaboration with USAID's *Market and Technology Access Project*. As a result, community-based forest management projects in Mexico are now exploring ecotourism projects and woodcraft programs with assistance from private U.S. firms.

These pilot programs and studies have provided the basis for longer-term efforts needed to engage private initiative and capital from both less developed countries and the United States to manage forests and associated resources responsibly. A data base of U.S. firms and NGOs interested in participating is being developed by USAID's FRM II project office.

Based on a recent study and workshop on "Strengthening Forest-Based Private Enterprise in Developing Countries," the private enterprise component plans to establish an Action Forum for Forest Protection and Production. This coalition of private industries, NGOs, and government agencies will initiate joint efforts to develop forest-based enterprises in the tropical and subtropical nations.

Collaboration with the Peace Corps. For some 30 years USAID has been working collaboratively with the Peace Corps on natural resource activities (see box 3.2, p. 63). One of the most successful of these collaborative programs began in FY 1980 through the FRM I agreement with the Peace Corps. Under FRM II the Peace Corps is authorized to receive \$4 million between FY 1991 and FY 2000.

With support from USAID, the Peace Corps' Office of Training and Program Support (OTAPS) is developing and promoting the use of sustainable natural resource practices, strengthening cooperation between the Peace Corps and other organizations and increasing the number of Volunteers working in forestry and biodiversity projects. OTAPS also

conducts natural resource programs in the areas of forestry, national parks and biodiversity, and environmental awareness and education.

During FY 1992 the Peace Corps sent 15 technical assistance and evaluation teams to provide short-term consultation in 14 countries on environmental matters. In addition, specialists carried out program development trips to 20 countries to help in-country staff initiate, redirect, or expand environmental projects. As a result, the Peace Corps increased the number of Volunteers in environmental projects to nearly 800 in 60 countries by the end of FY 1992. New environmental projects were launched in Argentina, the Comoros Islands, and the Philippines.

During FY 1992 the Peace Corps conducted technical workshop topics on a wide variety of environmental topics, including agroforestry, management of parks and wildlife, institutional development for nonprofit conservation groups, and environmental education techniques. USAID supported 67 technical workshops in 46 countries for Volunteers and their host country counterparts. One example is a workshop offered in Hungary in May 1993 to improve the Peace Corps' environmental programming in Central and Eastern Europe. Fifty-one Volunteers and their counterparts attended from the Czech Republic, Hungary, Poland, Slovakia, Kazakhstan, Russia, and Washington, D.C. Under the auspices of FRM II, this workshop was collaboratively sponsored and organized with USFS assistance. Such institutional cooperation is another often unrecognized benefit associated with FRM II.

According to a FY 1992 evaluation, the Peace Corps is doing an excellent job in using FRM II support to meet its own program objectives and those of USAID. The evaluation recommended that USAID support for the Peace Corps be extended to Central and Eastern Europe and the New Independent States of the former Soviet Union.

Box 3.2

Protecting Biodiversity through Conservation Education: USAID and the Peace Corps

Throughout the world, USAID and the Peace Corps are continuing their collaboration to expand host country environmental education efforts focusing on biodiversity. From development of curriculum materials to initiating park interpretive programs, Volunteers are working side by side with host country conservation educators to increase awareness and knowledge of biodiversity issues and provide the skills and commitment to help protect biodiversity at the local, national, and international levels.

For instance, in The Gambia and Senegal, Volunteers are initiating conservation education projects to help rural communities better understand the connection between biodiversity and a healthy environment. Volunteers working in forestry and agricultural extension are collaborating with Gambian and Senegalese extension agents to help community members understand the importance of protecting, using, and cultivating indigenous plants. Education Volunteers are also helping their students understand basic ecological concepts by introducing environmental content into the school curriculum and by getting students involved in after-school environmental activities.

In addition, Volunteers are working in Gambian and Senegalese parks and forest reserves to develop interpretive programs for the public, conduct surveys of flora and fauna, and assist with other biological research. Through these formal and nonformal education programs, which also help spread local expertise on flora and fauna, students and community members are learning to appreciate the diversity of plants and animals in their countries, understand which species are threatened, and discover what they as individuals can do to help slow environmental degradation and protect biodiversity.

Similar activities are taking place in other parts of Africa, Asia, and Latin America and the Caribbean. Volunteers in Costa Rica, the Dominican Republic, Honduras, Panama, and St. Kitts are working with government representatives to develop environmental curriculum materials that stress the importance of maintaining biodiversity in national parks. Volunteers are also designing exhibits, producing educational materials, conducting public education programs, and working with the media to help get the "biodiversity message" to the public. In Argentina and Chile, Volunteers teaching English are incorporating environmental content into their lesson plans. Many Volunteers are also working with local environmental educators to offer summer camps where students can improve their English skills while learning more about the natural world.

3.2 Biodiversity Conservation

By supporting biodiversity conservation projects, USAID is working to stem the loss of irreplaceable biological resources. USAID is supporting a wide range of research and conservation initiatives, not only in parks and other protected areas but also in areas where human activities are transforming the landscape and reducing the diversity of the planet's ecosystems, species, and genetic resources.

USAID has four major centrally funded efforts underway to promote conservation of biodiversity:

- The Wildlands and Human Needs Program aims to improve the ability of biologically important wildlands to meet local development needs on a sustainable basis, while preserving important ecological values.
- The Conservation of Biological Diversity Program, which funds the Biodiversity Support Program and a collaborative program for research with the National Science Foundation. (see box 3.3, p. 68).
- Project Noah promotes an international rescue mission for species preservation.
- The Innovative Science Research II project funds research in USAID-supported countries worldwide (see box 3.3, p. 68).

3.2.1 Wildlands and Human Needs

Established in FY 1985 by a USAID matching grant to World Wildlife Fund (WWF), the eight-year *Wildlands and Human Needs Program* (WHNP) promotes the integration of environmentally sound economic development with WWF's biodiversity conservation activities focusing on sub-Saharan Africa and Latin America and the Caribbean. This project signaled the beginning of a working relationship between the conservation community and USAID.

WHNP began this task by carrying out demonstration activities to promote a promising new approach to conservation—integrated conservation and development projects (ICDPs) (see box 1.3, p. 24). In FY 1992 WHNP shifted its approach from directly managing field projects to providing technical assistance, training, analysis, and information dissemination and networking to ICDPs and their implementing organizations. This initiative followed a midterm evaluation of the project's second phase in FY 1991, which pointed out the need to support the rapidly growing number of ICDP initiatives, rather than continuing to demonstrate the value of this approach.

Technical assistance. WHNP provides long-term assistance to ICDP staff on project design, proposal review, and evaluation. For example, in Nicaragua WHNP provides assistance to MIKUPIA, an indigenous NGO implementing a USAID project in the Miskito Coast Protected Area (see p. 146). Other WHNP technical assistance in FY 1992 included help to the Dzanga-Sangha Reserve in the Central African Republic, the Sierra de las Minas Reserve in Guatemala, and the Río Plátano Biosphere Reserve in Honduras.

Monitoring and evaluation are critical to the long-term success of ICDPs. WHNP headquarters staff work with WWF regional programs to strengthen monitoring and evaluation methodologies as well as field projects, particularly during the project design stage. For instance, in Tanzania WHNP is helping incorporate monitoring methodologies into the design of the country's first marine protected area, the Mafia Island Marine Reserve.

Training. Because methodologies are continually being developed and refined, training for personnel and institutions involved in ICDPs is a major component of WHNP. In FY 1992 WHNP training support focused on backing workshops, developing materials, and training trainers for local project staff and institutions.

In Africa training activities included a workshop in September 1991 on community-based conservation in southern Africa in Zimbabwe's Hwange National Park. In FY 1993 WHNP expanded on the Hwange workshop concept, developing a southern Africa Community-Based Conservation Network to disseminate information about successful ICDP experience in the region. The network is guided by a group of ten representatives from the governments and NGO communities of Botswana, Malawi, Namibia, The Zambia, and Zimbabwe.

Also in southern Africa, WHNP is developing materials and conducting workshops to train trainers and community development agents in training techniques, leadership skills, and topics such as participatory rural appraisal. The first workshop was held in The Zambia in November 1992.

In Latin America and the Caribbean, WHNP training activities in FY 1992 included continued support to the Cosecha (harvest) project. The project, developed by WHNP in collaboration with the NGO World Neighbors, provides hands-on, field-based training for project managers promoting environmentally sound development.

Information dissemination and networking. Organizing and disseminating information from ICDPs is a key task of WHNP, particularly because this field is still experimental and design and implementation experience remains somewhat limited. The theoretical basis for integrating biodiversity conservation and rural economic development is widely accepted, yet as a practical matter, linking the two goals at the field level has proven extremely difficult; thus, much can be learned from the experiences gained in current projects.

WHNP emphasizes the importance of "South-South" exchange—the transfer and dissemination of knowledge among developing countries. An example is a FY 1992 exchange comparing ICDP approaches in two very different areas of the world: the landlocked southern African country of Zimbabwe and the Caribbean island of St. Lucia.

In FY 1993 WHNP created an information network of ICDP materials and information and established a roster of ICDP professionals to facilitate dissemination of knowledge and experience.

Analysis. WHNP also disseminates lessons learned through publication of analytical papers on ICDP projects and methodologies. Two technical papers were published in FY 1992: one on integrated conservation and development and the other on ecotourism. WHNP published four papers during FY 1993 on topics including gender, biodiversity, and “ecobusiness” and a series of technical papers for ICDP field staff which will be compiled as a comprehensive resource book.

WHNP published two occasional papers in FY 1992: one on the Sierra de las Minas Biosphere Reserve in Guatemala and the other on designing ICDPs. Publication of four additional papers during FY 1993 on forest management in Niger, popular participation in resource management in St. Lucia, policy implications of ICDPs in Zimbabwe, and gender issues was planned.

A new WHNP initiative is the “in-house sabbatical” program at WWF, which provides WWF regional program staff the opportunity to analyze and synthesize their field work in ICDPs and to document and disseminate lessons learned. During FY 1993 two program officers from WWF’s Latin America and Caribbean Program were assigned to WHNP for eight weeks to analyze one issue facing an ICDP field project that each manages.

3.2.2 Conservation of Biodiversity

The *Conservation of Biological Diversity* project consists of two major elements: the *Biodiversity Support Program* (BSP), described below, and support to the National Science Foundation (see box 3.3, p. 68).

Box 3.3

USAID Funds Biodiversity Research

USAID regards the maintenance of biodiversity as key to humanity's continued existence on earth. We depend on animal, plant, and microbial species for food, fuel, fiber, drugs, and raw materials for a host of manufacturing technologies and products. The continuing success of animal and plant breeding and of genetic engineering depends heavily on our knowledge of biodiversity and our ability to conserve it. Maintaining nature's rich diversity is also essential to support the intricate web of life in ways we have only begun to understand.

Understanding biodiversity is fundamental to its conservation. Our knowledge of many important groups of organisms is still in its infancy, however, and the mechanisms that foster and maintain biodiversity remain obscure. USAID is committed to promoting research on biodiversity; three programs offer biodiversity research grants in target nations:

The Biodiversity Support Program (BSP) Small Research Grants Program. BSP operates this project to build capacities and strengthen institutions through locally managed grants averaging less than \$15,000. Many grants include training for host country nationals. In FY 1992 BSP awarded 34 grants to 31 host country nationals and three Western researchers with host country collaborators. In FY 1993 BSP received 323 proposals for consideration.

BSP is supporting research to develop conservation planning tools in Madagascar by assessing the use of butterflies as indicator species of biological richness through a technique known as target taxon analysis. Data collected will be used in planning a national park on the Masoala Peninsula.

A forest management research project, begun in FY 1991 in West Kalimantan, Indonesia, found that forest reproduction had diminished considerably in selectively logged areas compared with unlogged areas, thus endangering forest regeneration. Indonesian policymakers and land-use planners are using the results to review forest management policies.

At Kenya's Tana River National Primate Reserve, the National Museum of Kenya is investigating the implications for two primate species of the local Pokomo people's use of *Ficus sycamorus*. Researchers found that tree felling for canoe construction does not threaten the colobus and manglebey but that shifting cultivators could wipe out the trees; the reserve's planners now recognize that farmer interests have to be taken into account to create a truly sustainable system.

BSP's FY 1992 research grants included an inventory of wetlands wildlife in Bangladesh, a study of the role of indigenous women in reproducing plant cultivars in the Colombian Amazon, and research on local natural resource in India.

USAID/National Science Foundation (NSF) Collaborative Program on Biodiversity. In response to Congressional interest in 1990, USAID's *Conservation of Biological Diversity*

project supports research collaborations by U.S. researchers and host country counterparts. The NSF funds the U.S.-based component, whereas USAID funds host country researchers and institutions. Since FY 1991 annual funding has risen to \$1.5 million. As of FY 1993 the program had funded 59 projects in 28 countries. The program doubles the impact of USAID funding and helps focus the attention of the U.S. scientific community on biodiversity conservation and economic development research.

One example is research on protecting the black rhinoceros conducted by the University of Nevada-Reno in Namibia to help plan conservation initiatives in countries with endangered rhino populations. The research has analyzed economic pressures affecting rhino conservation and how management can minimize the threat of poaching.

Another project, the Plant Inventory of the Philippines, is identifying species in the primary forests in that archipelago. Originally funded in FY 1990, this highly successful project has been funded for an additional three years. The project has greatly expanded the capacity of the Philippine National Herbarium to collect, process, and maintain plant samples, many of which are the only holdings of species that exist only in the Philippines.

A FY 1991 grant through a scientist in Costa Rica is training graduates of INBio's "parataxonomist" program to be "para-ecologists." Parataxonomists categorize and inventory plant and animal samples collected in the wild. Paraecologists receive additional training on ecological relationships and natural history so that they can monitor populations and how environmental changes affect them and inform the planning and management process for Costa Rica's biological resources.

Innovative Science Research II (ISR II). To strengthen scientific research capacity in USAID host countries and support innovative and collaborative scientific research relevant to development, in FY 1990 USAID initiated this ten-year, \$48 million project—a continuation of the Innovative Science Research (ISR I) project, which began in FY 1981. ISR II funds research in USAID-supported countries worldwide. During FY 1992, \$2.4 million was obligated for research activities supporting tropical forest and biodiversity conservation. For example, the New York Botanical Garden is collaborating with the Herbario Nacional de Bolivia to study sustainable economic uses of two indigenous species of palms. Palms are among the most important plants to humans in the American tropics; the ISR II grant will contribute to developing more sustainable management practices for these tree species.

In Costa Rica ISR II funded research by North Carolina State University and the Center for Tropical Agricultural Research and Education on simple low-cost techniques for propagating multipurpose trees for agroforestry and reforestation. For many Central American tree species, the seedling stock developed under this grant will be the region's first genetically proven seed sources.

Ongoing research activities include a University of Washington study in Ecuador of natural compounds for integrated pest management and a University of Wisconsin project in Rwanda to promote natural seed dispersal needed in forest regeneration.

USAID is working to stem the loss of unique plant and animal species through a range of research and conservation initiatives, not only in parks and other protected areas but also in areas where human activities are transforming the landscape and reducing the diversity of the planet's ecosystems, species, and genetic resources. The *Biodiversity Support Program* (BSP) seeks to develop and support efforts that will have far-reaching impacts by testing new approaches, answering critical research questions, and building indigenous capacity and knowledge to enhance biodiversity conservation initiatives. Created by a six-year, \$22.5 million cooperative agreement between World Wildlife Fund (WWF) and the R&D Bureau, BSP is managed by a consortium of WWF, The Nature Conservancy (TNC), and World Resources Institute. BSP's portfolio has grown from two projects in FY 1989 to more than 140 projects in 36 countries today. A FY 1991 midterm evaluation concluded that BSP "has been an extraordinarily successful program,"⁵⁶ reaching the conservation and development community through a broad range of activities.

Pilot demonstration projects. The largest share of BSP technical and financial support is devoted to innovative initiatives that support conservation of biodiversity. New pilot demonstration projects for FY 1992-93 include the following:

Protected Areas Resources Conservation Strategy (PARCS). The PARCS project seeks to increase effective management of protected areas in East, Central, and southern Africa, where often inadequately trained staff are taking on greater and more complex development and conservation responsibilities. BSP provides technical assistance to the project, which assessed regional training needs in phase I and in phase II will (1) assist in the development of in-country training plans and processes, (2) help test training methods, and (3) recommend steps for training senior-level, protected-area staff in all three regions.

Assessing conservation needs in Papua New Guinea (PNG). Recognizing the economic and cultural importance of PNG's highly diverse forests and marine and coastal

ecosystems, PNG's government invited BSP to conduct a 15-month Conservation Needs Assessment (CNA), part of the country's Tropical Forestry Action Plan. Since December 1991 the CNA has been identifying conservation priorities and how to implement them and promoting dialogue among PNG landowners, who have strong customary, economic, and legal incentives to use and conserve natural resources sustainably.

A conservation strategy in Bulgaria. Although conservation organizations and government agencies are now providing technical assistance and support to begin reversing contamination of Central and Eastern Europe's environment, the conservation of biodiversity has received less attention. In Bulgaria, BSP is drafting a National Biological Resources Conservation Strategy to summarize and assess the status of and threats to biodiversity in Bulgaria and to map the most biologically important areas in a geographic information system. The strategy will also describe a legal, cultural, and institutional framework for conservation action and recommend next steps to the government, NGOs, citizens, and the private sector.

The Biodiversity Analysis for Africa (BAA) project. The BAA project, a new approach to developing priorities and testing strategies for biodiversity conservation in Africa, is designed to assist the Africa Bureau, USAID missions in Africa, government agencies, and NGOs. BAA will have a potentially far-reaching impact on biodiversity conservation in Africa. The project established the African Biodiversity Consultative Group, composed of representatives from East, West, southern, and Central Africa. In FY 1992 the group identified critical biodiversity conservation issues for incorporation into a framework for integrating biodiversity conservation and sustainable development for USAID's Africa Bureau. Key conservation approaches outlined by the consultative group and others are being tested through the BAA's grants program. Activities funded include investigation of community-based conservation in Namibia and market-driven forest and biodiversity conservation in Cameroon.

Technical assistance. BSP's technical support plays an important role in assisting USAID and others in designing and evaluating conservation approaches. For instance, in FY 1992 BSP provided technical assistance in Ecuador to design a set of verifiable indicators for assessing the impacts of the innovative ICDP *Sustainable Uses for Biological Resources* (SUBIR) project. Comprehensive monitoring of SUBIR will provide valuable lessons for other ICDPs. BSP also organized a second evaluation of the *Forest Conservation and Management Project* (BOSCOSA), a landmark ICDP in southwestern Costa Rica conceived by World Wildlife Fund (WWF) and Fundación Neotrópica in 1987. This evaluation focused on recommendations for future funding directions.

Research grants. BSP's competitive Small Research Grants Program (see box 3.3, p.68) addresses the importance of local capacity building and institution strengthening. Virtually all the grants are awarded to developing country scientists for locally developed projects, and many include training for host country nationals. In FY 1992 BSP received nearly 500 proposals, of which 34 were selected to receive funding, averaging \$14,481 per grant.

Training. BSP supports a variety of training projects to help host country individuals and institutions develop conservation and management skills that enhance the long-term viability of local organizations. Ongoing training activities include preparation of training guides by WWF's Organizational Development Program and BSP support to Costa Rica's National Institute for Biodiversity (INBio) for training "parataxonomists"—local people who acquire basic ecological and taxonomic skills to serve as biological collectors and observers, able to perform biodiversity surveys at low cost and with minimal assistance.

Information and evaluation networking. BSP disseminates information on recent advances in biodiversity conservation to develop and strengthen the network of people and organizations working in biodiversity conservation worldwide. For example, in FY 1992 BSP sponsored 20 subscriptions to the journal *Conservation Biology* for developing country

conservationists, workshop proceedings from the USAID-funded *PVO-NGO/Natural Resources Management Support* project on buffer zone management in Africa, and research papers on the biodiversity of Mexico's Montes Azules Biosphere Reserve. In addition, BSP began publishing lessons learned from innovative biodiversity conservation projects along with analysis of the methodologies they used. BSP's well-attended monthly seminar series at WWF's headquarters in Washington, D.C., attracts international scholars, resource managers, and the public to discuss biodiversity issues.

3.2.3 Project Noah

In 1990 Congress requested that USAID study the need for *ex situ* conservation of biological diversity and programs requiring support through Agency assistance. The project was originally envisioned by Congress as an "international rescue mission for the thousands of animal and plant species faced with the prospect of imminent extinction." It was named *Project Noah* in reference to the biblical story of Noah.

The Bureau for Science and Technology (the predecessor to the R&D Bureau) responded to the Congressional request by preparing a report to Congress titled, "*Ex Situ* Conservation: Present Status and Future Priorities." Based on recommendations in this report, Congress authorized USAID to initiate preservation activities, Congress obligated \$750,000. Awards were made to three institutions—the Mexico-based International Maize and Wheat Improvement Center (CIMMYT), the Genetic Resources Conservation Program at the University of California at Davis, and *Diversity* magazine.

The goals of Project Noah and its respective initiatives are to:

- stimulate urgent concern for the loss of the world's diversity,
- promote the science and technologies necessary to advance the *ex situ* preservation of genetic material, and

- foster within the foreign aid community a recognition that a healthy natural environment is an indispensable requirement for successful human development.

The three grants supported through the FY 1991 appropriation support the following activities:

- *Conserving maize (corn) germ plasm.* To support the first coordinated, multinational effort to regenerate, characterize, and preserve the genetic stocks of maize, a \$319,000 grant was provided in FY 1991 to CIMMYT. CIMMYT's collaborative efforts with 13 Latin American and Caribbean countries serve as a model for future efforts to coordinate the regeneration of valuable genetic resources before they are lost.
- Under this grant, corn regeneration field nurseries are being established in each participating country to increase the quantity and quality of corn seed in germ plasm banks. Regeneration plantings have already begun in Colombia, Guatemala, and Mexico. The grant will also back the development of a data base linking germ plasm banks throughout Latin America and the Caribbean.
- *Genetic resource conservation training.* In response to legislation requesting USAID to "establish training programs and courses in *ex situ* management and preservation for developing country scientists, a \$236,000 grant was awarded to the Genetic Resources Conservation Program at the University of California at Davis. This program addressed *ex situ* conservation for animals and plants. Forty-seven participants from 31 countries attended the courses in FY 1992, which focused on existing germ-plasm methods, current technologies, and domestic and wild species conservation programs.
- *Information dissemination.* A grant of nearly \$195,000 was awarded to *Diversity* magazine⁵⁷ to disseminate information on *ex situ* conservation. The journal has broadened editorial coverage of *ex situ* conservation worldwide and increased its circulation in developing countries over a three-year period. The grant funds 500 subscriptions to key scientists and institutions in developing countries and is establishing an international network of individuals associated with germ plasm programs.

Future activities. USAID has sponsored a meeting of experts in *ex situ* conservation to outline the priorities for research and developmental support. The panel's report will be used to set USAID priorities for support of *ex situ* conservation in the context of a comprehensive approach to conservation of biological diversity.

3.2.4 Coastal Resource Management

Unlike tropical rain forests, coastal zones are subject to dense coastal populations, industrial and municipal wastewater, increasing fishing pressures and expanding mariculture. These forces are jeopardizing the valuable functions of coastal zones as breeding and nursery habitats for oceanic and nearshore fishes, as physical buffers for storm surges, and as recreational sites. Protection and management of diversity of biotic communities in the coastal zone is the principal issue.

USAID's largest coastal resource management project is the R&D Bureau's \$14 million *Coastal Resources Management (CRM)* project. Initiated in FY 1985 as a five-year project through a cooperative agreement with the University of Rhode Island, in 1990 CRM was extended through May 1995. CRM supports the sustainable use and protection of coastal ecosystems, including their highly productive mangrove forests and coral reefs, through the integrated management of environmental, social, cultural, and institutional factors associated with the conservation and use of coastal resources.

Initial efforts were focused on pilot projects in three countries: Thailand, Ecuador, and Sri Lanka. Through these pilots CRM has accumulated considerable practical experience. Extension of the project period allowed CRM to broaden its scope and shift its emphasis from support of the pilot projects to documentation and wide dissemination of effective coastal management techniques. CRM activities include policymaking, extension and training, encouragement of public/private sector partnerships, and research and education.

CRM's success stems from its two-track approach, which simultaneously strengthens the agencies of central governments and empowers local communities, which have a vested interest in managing natural resources effectively. By creating locally specific management plans, CRM has been able to test management techniques quickly without the risk or expense of implementing a nationwide plan. The experience of the local experiments then becomes the basis for action at the national level.

The three-country pilot programs have also emphasized the need to build long-term, in-country collaborations and develop a cadre of trained local professionals to continue natural resource management efforts.

Ecuador. CRM activities in Ecuador have focused on building a local constituency for coastal management and developing the National Coastal Resources Management Program. Ecuador's fishing and shrimp industries, on which the country depends for food and foreign currency, were facing a serious decline due to the clearing of mangrove forests, reduced water quality, overfishing, and conflicts among coastal resource users. To involve local residents in deciding how best to solve their problems, public workshops were held in each coastal province to design workable solutions to coastal management problems. Through public participation efforts and CRM's technical work, Ecuador adopted the National Coastal Resources Management Program in 1990 and established an interministerial Coastal Commission. Six special management zones and an interagency ranger corps were established to enforce existing regulations affecting coastal resources better. Advisory committees made up of local government officials and representatives of local user groups were appointed to assist in the development of natural resource management plans for the management zones.

In May 1992 five of these plans were approved by Ecuador's National Coastal Commission. The plans address key issues, including mangrove conservation and shore use

controls, water supply and waste disposal, sustainable mariculture and fisheries development, and protection of tourist areas and expansion of the quality of tourism services as an alternative source of income. A team of Ecuadoran technical experts and local leaders with substantial experience in the methods of participatory resource management has been created. This team is sustaining the Ecuador project and has also played a major role in extending CRM outcomes to other Latin American nations. In July 1993 the project was awarded a national prize sponsored by the Fundación Natura for outstanding work in environmental protection and conservation.

USAID's investment of \$2.9 million in the pilot project has resulted in a sustainable National Coastal Resources Management Program, which is making a difference on the ground by:

- organizing and supporting 33 local resource user groups,
- involving community members in monitoring and enforcing conservation laws,
- offering environmental education programs,
- providing practical exercises in management, which have reduced contamination of the Rio Atacames,
- experimenting with cultivation of locally important shellfish species, and
- initiating mangrove forest restoration and creating Ecuador's first "mangrove boardwalk" to promote education and ecotourism.

The success of the project has leveraged additional bilateral support. The Government of Ecuador and the Inter-American Development Bank are in final negotiations for a \$13 million loan to fund the next phase of the project, which will carry out many of the actions specified in the local plans as well as further national policy development and projects in public education, staff training, institution strengthening, and applied scientific research.

Thailand. In Thailand the CRM project focused on coral reef management. More than 60 percent of Thailand's coral reefs are degraded; damage from destructive fishing practices

(such as dynamiting and trawling) and damage from tourism activities are increasing. Increasing sedimentation and pollution from nearby land development are killing live coral. In the target area of Phuket, losses in reef quality have resulted from siltation caused by offshore tin-mining operations and increasing nutrient discharges from sewage and runoff.

The CRM project in Thailand took a two-track approach to these problems. The initial local demonstration project in Phuket Province protected and provided for sustainable use of the area's coral reefs and built local and national support for addressing other coastal management issues. The pilot project utilized public awareness campaigns, workshops, and participatory educational activities for local users, combined with the demonstration of a simple but effective technology—mooring buoy installation—to begin project implementation. Together, these activities motivated the community to support actions to protect the coral reefs, leading to cooperation between local government and local entrepreneurs, including hoteliers, tour boat and dive shop operators, and local fishermen. Local and national coverage of the project led to widespread appreciation of the value of coral reefs in government, NGO, and tourism circles, thus developing a constituency for coral reef management.

Building on this support, CRM developed the Thailand National Coral Reef Protection Strategy, formally adopted in April 1992, which stresses local planning and management through partnerships. Nearly \$2 million has been allocated by the Thai government to initiate the strategy and manage coral reefs on a sustainable basis, supporting multiple uses such as fisheries, tourism, conservation, education, and research. Full implementation of the strategy over the next ten years could significantly increase coral reef quality and make Thailand a global leader in coral reef management.

Sri Lanka. Sri Lanka's program grew in response to the urgent need to manage shorefront erosion along its densely populated and exposed southwestern coast. The initial Sri Lankan

pilot project was a modest \$500,000, five-year effort to help government officials develop the Sri Lanka Coastal Zone Management Plan (CZMP). The plan, which was ratified by the Sri Lankan cabinet in April 1990 and is now being implemented by Sri Lanka's Coast Conservation Department, has done much to bring order to the nation's coastal development process and avoid costly, environmentally damaging development mistakes. Efforts to assess long-term trends and to plot a course for future coastal resource management were carried out by a Sri Lankan team of experts; the effort resulted in *Sri Lanka Coast 2000*,⁵⁸ a resource management strategy for Sri Lanka's coastal region. A central element of the new strategy is local planning; Sri Lanka is now working to develop two special-area integrated management plans along the coast. The USAID mission in Colombo has built on the CRM pilot approach to design its *Natural Resources and Environmental Policy Project* and has fully funded a \$2.4 million extension of the centrally funded coastal pilot project.

Training. CRM provides practical and professional training in integrated coastal management at the University of Rhode Island (URI), in pilot countries, and in regions. CRM offers a four-week course at URI's Summer Institute in the design and management of integrated coastal resources programs and a two-week course on special-area management as collaborative efforts between URI's Coastal Resources Center and selected regional universities within Asia and Latin America. Regional short-term training courses were held in Thailand and Ecuador in the spring of 1992 and 1993, respectively, and one for Asia was held in the Philippines in October 1993. Another is planned in Ecuador in 1994. As of 1993, 91 participants from 32 nations have attended one of these international courses. CRM has developed curriculum materials, including a teaching case study on implementing coastal resource management policy⁵⁹ and a guide to coastal zone impact assessments.⁶⁰

Institution strengthening. CRM helped establish the Coastal Resources Institute (CORIN) in FY 1990 at the Prince of Songkla University in southern Thailand. CORIN is the locus of coastal conservation activities for the region, including the formulation of management

strategies and the coordination of training, education, research and development, and public participation. CRM has defined and helped implement a strategy to strengthen CORIN, emphasizing "learning by doing" as well as traditional human resource development activities. Doctoral-level training at URI nearing completion for selected Prince of Songkla University faculty in resource economics, natural resource science, and ocean engineering. Associates from CORIN have also received short-term training through a series of study tours to U.S. universities active in coastal management. The CORIN effort has served as a model for defining how university-based regional centers in coastal resource management can contribute to sustainable management initiatives. CRM is using this model to define similar roles for institutions in Sri Lanka and Ecuador.

Outreach. Disseminating experience gained and building global and regional networks of coastal resource managers are important activities of the project, accomplished through a variety of means:

- *Publications.* CRM has published and disseminated a series of studies to help developing country practitioners formulate strategies and policies for coastal zone management. These include documents from pilot projects that provide models of coastal management plans, strategy analyses, and policy papers as well as documents analyzing CRM and other experience in coastal management.
- *Global and regional networks.* CRM has helped expand regional networks to link coastal resource management practitioners worldwide and to strengthen regional links. It has also developed a series of newsletters for coastal resource managers.
- *Technical assistance.* CRM has provided in-country assistance to USAID missions in Indonesia, El Salvador, and the Philippines working to design new programs with important coastal components. CRM conducted a comprehensive coastal resource management strategy for USAID's Regional Office for Central American Programs in FY 1992.
- *Assistance to other donors.* CRM has joined with the United Nations Development Programme, the U.N. Environment Programme, and the

Consultative Group on Biodiversity to help define a Coastal Management Agenda following the 1992 United Nations Conference on Environment and Development.

3.3 Environment and Natural Resource Management

Several USAID projects that promote improved environment and natural resource management are also directly relevant to tropical forests and biodiversity. These focus on strategies to improve land-use management and reduce environmental degradation, thus helping to prevent the unnecessary loss of tropical forests and the species they contain. The projects described here illustrate the range of technical services provided by the R&D Bureau to USAID missions in developing countries, to host country governments, and to NGOs and other groups working to protect tropical ecosystems.

3.3.1 Management of Fragile Lands

Throughout the tropics, millions of poor rural families have been forced, through circumstances beyond their control, to farm “fragile lands”—terrain with serious constraints to production and easily degraded by inappropriate farming practices. Fragile lands include steep hillsides, lateritic soils, semiarid regions, and much of the world’s rain forest area. To address the problems and opportunities associated with these areas, USAID’s R&D Bureau is implementing the *Development Strategies For Fragile Lands II* (DESFIL II) project.

DESFIL II, initiated in FY 1991, is a five-year project with a core funding level of \$3.4 million. The new project succeeds the DESFIL I project, which began in FY 1986 and was limited to Latin America and the Caribbean. DESFIL II is designed to consolidate the lessons learned from DESFIL I, sharpen the research focus, and address the problems of fragile land management worldwide. A five-person technical staff networks with the international development community, disseminates information and provides technical assistance.

DESFIL II is helping USAID and other organizations to understand better the attitudes, behaviors, and other factors affecting resource users' management of fragile lands. Armed with this information, the project is helping USAID missions design and implement practical strategies for more effective management of fragile lands. These strategies focus on improving technical interventions (such as agroforestry, terrace farming, and windbreaks) and also identifying policy and institutional constraints and opportunities associated with the degradation of natural resources.

The project concentrates on three primary activities: research, synthesis of research results, and integration of research findings into field activities. Some highlights for FY 1992 follow:

- Analytical efforts focused on three priority research areas: natural forest management, sustainable agriculture, and indigenous peoples. Project staff are now identifying new research activities.
- DESFIL II organized a conference in Washington, D.C., on tenure issues in forest management in Latin America and the Caribbean. The 32 participants explored the relationship between tenure and slowing deforestation in tropical lowlands.
- DESFIL II established the Gender and Natural Resources Group, which aims to increase understanding of the role of women in natural resource management in developing countries. The group offers monthly seminars, publishes a newsletter, and conducts research.
- DESFIL II provided support to the *Regional Environmental and Natural Resources Management* (RENARM) project to develop a tool for analysis of resource management policies (see p. 151). The document guides resource managers through a series of questions about a given problem or situation. Each policy analysis includes discussion of tradeoffs among goals for economic development, welfare, and conservation. DESFIL II also facilitated a review of the document at a RENARM conference in Guatemala City in May 1992.

3.3.2 Property Rights and Tenure

Resource tenure and property rights often influence patterns of natural resource management—or mismanagement. These rights vary from culture to culture and are frequently gender specific. Understanding the distribution of these rights among states, communities, families, and individuals is essential to making informed decisions that promote sustainable resource use.

USAID's *Access to Land, Water, and Other Natural Resources II* (ACCESS II) project provides research and technical assistance on property rights and tenure to host country and USAID-mission officials, and others in the development community.⁶¹ Initiated in FY 1989, ACCESS II is being implemented by the Land Tenure Center (LTC) at the University of Wisconsin–Madison. During its first five years, the project has received authorizations of over \$10 million. Research themes include land markets and transactions, tenure issues in natural resource management, the institutional and structural dimensions of tenure change, crosscutting issues of tenure security, and the impact of tenure arrangements on women. ACCESS II activities have focused on Africa, Latin America and the Caribbean, and more recently, the New Independent States of the former Soviet Union and Eastern Europe. Examples of ACCESS II activities include the following:

Technology adoption. Early in 1992 LTC began studying the role of land tenure in farmer adoption of agroforestry technologies in Burundi, Uganda, and The Zambia. The research identified post-harvest grazing on farms as constraining agroforestry. Four workshops will be held to develop policy responses.

Protected areas. Land tenure in and around protected areas was the major topic of two workshops, one on Africa and one on Latin America and the Caribbean. LTC is incorporating workshop results in its research agenda, focusing on land use planning in buffer areas to reduce pressure on forested areas. Research findings will be used by USAID

and national agencies to plan and implement projects, such as the *Action Program for the Environment* project in Uganda. The research has found that evaluations that focus only on program impact on protected areas can miss important environmental side effects in nearby areas. LTC published workshop findings in the *LTC Paper* series⁶² and is distributing them to USAID missions, NGOs, and host country government agencies.

Community resource management. USAID programs seeking better tropical forest and biodiversity conservation must begin by understanding existing community resource management patterns as they are influenced by tenure. In Senegal, The Gambia, and Guinea, LTC has explored and enhanced government and NGO understanding of these patterns through the use of Participatory Rural Appraisal methodologies for tenure research.

Tenure change. Research on changing land tenure patterns has improved understanding of processes that enhance individual tenure rights;⁶³ it suggests cautiously adapting tenure systems rather than immediately replacing one system with another. Subsequent research has focused on legal codes, laws, and institutional mechanisms that encourage or discourage changes in tenure rights. Mission-funded activities have included research on land distribution and land law in Guinea-Bissau and land dispute settlement and conflict resolution in Mauritania and Uganda.

Land markets. LTC's land market research in Africa focuses on the impact of land market policy on agricultural investment, economic growth, and sustainable land-use management through studies in Mozambique, Ghana, The Gambia, Guinea, The Zambia, and Guinea-Bissau. The program identified key linkages between certainty of rights and investment in natural resource-conserving technologies, land market constraints to growth in agricultural productivity, and the negative effects of land use policy in some countries. These findings led to policy interventions to liberalize markets and enhance economic growth.

Gender. LTC, with financial participation from USAID's Women in Development Office, has incorporated gender issues into its research and technical assistance. An October 1991 workshop on "Gender Analysis and Natural Resource Tenure" discussed the importance of and methodologies for incorporating gender analysis into tenure research and technical assistance. The project has alerted those planning land privatization initiatives to the danger of concentrating new land rights in male heads of households.

3.3.3 Policy, Planning, and Management Assistance⁶⁴

To help public and private institutions in developing countries incorporate sound environmental and natural resource management policies and strategies into national and local development planning, USAID has been supporting the *Environmental Planning and Management* (EPM) project since FY 1982. In FY 1992 the project was extended for three years with an additional \$15 million. An EPM II is under design and scheduled to be authorized late in FY 1994.

Center for International Development and Environment. The largest component of EPM is implemented through a cooperative agreement with the Center for International Development and Environment (CIDE) of the World Resources Institute (WRI) and is one of WRI's major activities. CIDE's work on EPM covers four areas of activity: natural resource management strategies and assessments; natural resource sector planning and assessments; community planning and NGO support; and natural resource information management. Highlights of EPM activities in FY 1992-93 that support tropical forest and biodiversity conservation are described below.

Natural resource management strategies and assessments. Activities in this area cover environmental (including tropical forest and biodiversity conservation) planning and policy development in Africa, Latin America, and Asia on a national, regional, and sectoral level and include policy advice and technical support to National Environmental Action Plans

(NEAPs), Country Environmental Profiles, and other strategic action planning and policymaking processes in developing countries. Technical assistance on economics and natural resource accounting is also provided through this component.

EPM activities in natural resource management strategies and assessments include:

- *Promoting sound natural resource policies in Africa.* CIDE and the Africa Bureau are focusing many of their activities in Africa on the linkages between national policies, intermediary government institutions and NGOs, and natural resource use at the local level, and on how local people can influence national decision makers.

The Policy Consultative Group (PCG), an advisory group organized by CIDE in 1992 and composed of practitioners and scholars of policy planning and resource management issues in Africa, is seeking to strengthen policy initiatives, particularly of African governments. With additional support from the Africa Bureau and Missions, the PCG has focused its early work on environmental institutions at national and subnational levels. Reports are available from Madagascar, Uganda, and Tanzania;⁵⁵ information on the lessons learned in these studies will be distributed to African governments and organizations launching policy initiatives.

EPM is also helping to prepare and implement NEAPs in Madagascar, Rwanda, and Uganda, especially by addressing organizational development, land tenure, and coordination with NGOs. In 1993 CIDE was selected by the Network for Sustainable Development in Africa, the African-based secretariat on NEAPs, to play a lead role during the next two years in developing and implementing an analytical agenda to examine environmental policy initiatives (such as NEAPs) and to identify opportunities for and constraints to environmental policy reform.

- *Guiding USAID environmental efforts in Latin America and the Caribbean.* In late 1992 CIDE completed a comprehensive environmental strategy project for the Latin America and the Caribbean (LAC) Bureau that resulted in *Green Guidance: Integrating Environmental Concerns in AID Programming in Latin America and the Caribbean*.⁶⁶ Intended for a broad audience, this manual examines

urban, industrial, and tropical forest and biodiversity environmental problems in the region; identifies priorities and strategies for sustainable development; and suggests ways to integrate environmental concerns into sectoral policies. Well-received by USAID missions, the report is now in its second printing and is being translated into Spanish to increase its audience in LAC.

- *Strengthening institutions in Latin America and the Caribbean.* Institution strengthening is an EPM priority in LAC. USAID's steady support through EPM for the Central American Commission on Environment and Development (CCAD) has strengthened this regional forum at the presidential level to develop initiatives, such as the regional Tropical Forestry Action Plan (TFAP) for Central America and the recently signed Biodiversity Treaty for Central America.
- *Developing methods and tools for planning and management in Asia.* To move toward sustainable development, many Asian countries are adapting Western methods and tools for environmental planning and management. With the participation of host country governments, NGOs, and citizens, CIDE is studying laws and policies on tenurial rights within public forest and marine zones in a number of Asian countries. Their preparation has in many cases advanced national discussion of the topic, generated innovative responses (based on existing laws and policies) to local disenfranchisement, and promoted community forestry. In 1992 CIDE published case studies on tenurial rights in Thailand and Papua New Guinea;⁶⁷ as of July 1993, studies had been drafted on the Philippines, Nepal, Sri Lanka, and Indonesia.

Natural resource sector planning and assessments. This component of EPM covers policy research, strategies, assessments, and community-based training aimed at developing and implementing sustainable practices in agriculture, forestry, and biodiversity conservation.

In many locations around the world, foresters are experimenting with silvicultural techniques that promise to maintain natural forest processes while allowing production of timber and other products. In March 1991 CIDE sponsored a meeting of internationally known experts and senior officials from U.S. government and international development agencies. The discussions held at this meeting led CIDE to conduct additional policy

research on natural forest management. In April 1993 this research culminated in the first comprehensive publication on the topic, *Surviving the Cut: Natural Forest Management in the Humid Tropics*.⁶⁸

Community planning and NGO support. EPM activities in this area are strengthening the capacity of NGOs, policy research organizations, and grass-roots groups to analyze environmental and natural resource conditions that may affect their livelihoods, formulate responses to those issues, and participate effectively in planning and policy-making processes in their countries. This activity seeks to build institutional capacities through environmental training and the preparation and dissemination of guidelines and manuals on new methodologies and strategic planning techniques for environmental policy and natural resource management. The program also focuses on strengthening the abilities of local, regional, and national government programs to engage the participation of these nongovernmental groups. Technical assistance in strategic planning and in the design and implementation of consultation processes with resource user groups is being provided.

For example, in Mexico CIDE is helping develop and implement a Program for the Protection of the Mexican Tropical Forest (PROAFT). CIDE is providing technical assistance in strategic planning and in implementing a consultation process between PROAFT and forest resource users to integrate these key stakeholders into the process. In addition, CIDE collaborated with the Mexican Grupo de Estudios Ambientales (GEA) to strengthen the ability of four Mexican NGOs to work with local communities in defining and resolving natural resource management problems. CIDE also helped GEA and other grass-roots groups develop methods for local and regional planning in six Mexican states. As a result of this work, GEA has gained sufficient expertise in boosting local participation that it now coordinates PROAFT's grass-roots operations and provides technical assistance to such international assistance organizations as the Inter-American Foundation and The Nature Conservancy.

Natural resource information management. Efforts in this area assist policymakers and planners in compiling, accessing, and using environmental data more effectively. This includes developing statistical indicators for monitoring and assessing environmental conditions and trends, compiling directories and guides to information sources, and developing information policies and strategies for international agencies, national governments, and NGOs.

One example of this kind of activity is an effort to strengthen information services in Africa. To meet anticipated increased demand for environmental information in Africa, the World Resources Institute (WRI), in collaboration with the Africa Bureau, established the Natural Resource Information Consultative Group (NRICG) to provide consultative and advisory services to WRI, USAID headquarters, missions in sub-Saharan Africa, African governments, and private organizations on natural resource information management issues (including but not restricted to geographic information systems and remote sensing) and help organize and develop a body of case studies, guidelines, and lessons learned that can be used by policymakers and resource planners in Africa. The NRICG is a group of environmental information specialists drawn from universities, research institutions, government departments, and international organizations.

Environment and Natural Resources Information Center. In addition to the grant with WRI, EPM funds a contract to manage the Environment and Natural Resources Information Center (ENRIC) to serve USAID's strategic planning and reporting needs in environment and energy. With annual USAID funding of about \$1 million, ENRIC tracks environmental and energy-related activities supported by USAID and prepares a series of formal reports on progress and lessons learned.

Among a number of publications produced by ENRIC during FY 1992-93 is this report from USAID to Congress on USAID efforts to conserve tropical forests and

biodiversity during the period FY 1992-93, updating a previous report for FY 1990-91.⁶⁹ In FY 1994, ENRIC also produced a review of satellite mapping of tropical forest cover and deforestation with recommendations for USAID.⁷⁰

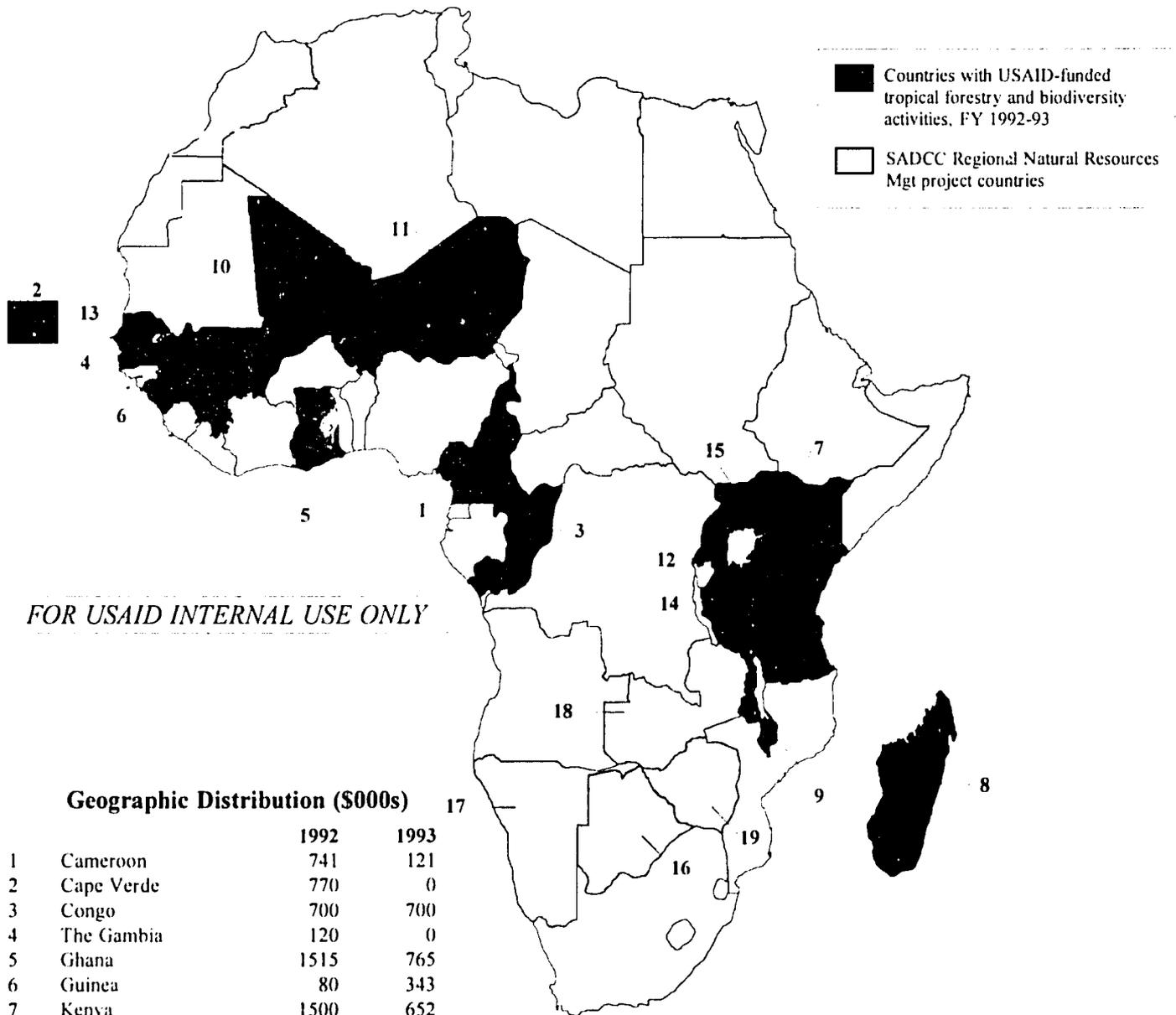
Chapter 4

USAID Activities in Africa

The productivity and well-being of Africa's agrarian and pastoral peoples are—perhaps more than on any other continent—directly linked to the wise use and conservation of the natural resource base, yet that natural resource base continues to be seriously threatened and degraded. USAID's programs in Africa—particularly in sub-Saharan Africa—target the special and urgent problems of the region: widespread poverty, extensive environmental degradation, drought, loss of biodiversity, and inadequate food production.

Bureau strategy for biodiversity and forest conservation. Central to USAID's activities in the region is the environment strategy for Africa,⁷¹ launched by the Africa Bureau in FY 1992. The strategy focuses on two of the five problem areas identified by USAID's 1992 environment strategy: unsustainable agricultural practices and loss of tropical forests and other critical habitats for biodiversity. In particular, the Bureau's technical priorities emphasize preventing loss and degradation of vegetation, curbing soil erosion, stemming declines in soil fertility and biodiversity, and promoting integrated pest management. The strategy joins agricultural and environmental issues, integrating biodiversity conservation, crop production, forestry, and soil and water conservation into planning, policy and institutional reform, and field activities. In addition, the Development Fund for Africa (DFA), established by Congress in FY 1987, requires the Bureau to demonstrate improvements in people's lives as a result of USAID assistance. Congress has requested that USAID target 10 percent of its DFA obligations for natural resource management.

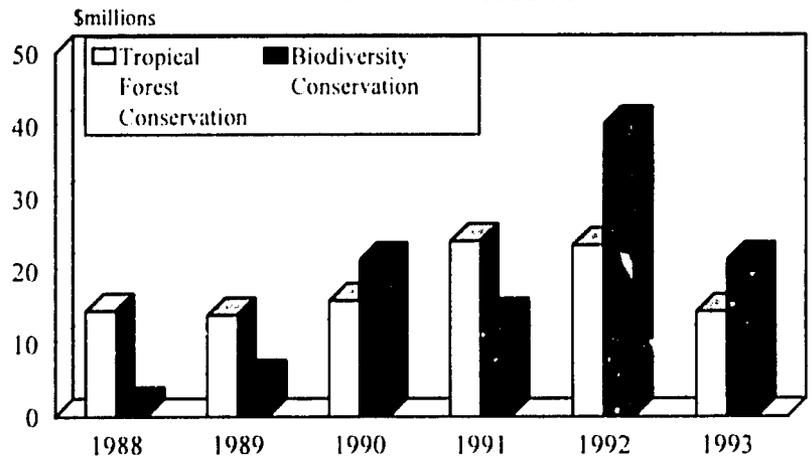
Figure 4.1: Bureau for Africa, FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations



Geographic Distribution (\$000s)

	1992	1993
1 Cameroon	741	121
2 Cape Verde	770	0
3 Congo	700	700
4 The Gambia	120	0
5 Ghana	1515	765
6 Guinea	80	343
7 Kenya	1500	652
8 Madagascar	22881	15460
9 Malawi	507	906
10 Mali	1987	1768
11 Niger	1406	250
12 Rwanda	0	0
13 Senegal	6900	4500
14 Tanzania	0	0
15 Uganda	4920	3937
-- Regional Projects		
Africa	1463	1284
SADCC	8900	3100
16 Botswana	--	--
17 Namibia	--	--
18 Zambia	--	--
19 Zimbabwe	--	--
Total	54,390	33,786

**Bureau Totals
Fiscal Years 1988-93**



Funding trends. The distribution and funding levels of the Africa Bureau's tropical forest and biodiversity conservation program are shown in Figure 4.1. Funding peaked at \$54 million in FY 1992 due to unusually large obligations for biodiversity conservation in Madagascar. In FY 1993 funding dropped back to levels similar to those in FY 1990–91 of \$30 million. Since FY 1991 biodiversity conservation activities have generally surpassed forest conservation in activities in Madagascar, Botswana, and Uganda, in particular.

4.1 New Activities

The section that follows describes several new initiatives in FY 1992 that build on the Africa Bureau's environmental strategy. The remainder of the report discusses ongoing USAID activities in Africa relating to tropical forestry and conservation of biodiversity.

4.1.1 Natural Resource Policy and Analysis

Launched in June 1992, the seven-year, \$74 million *Policy, Analysis, Research, and Technical Support* (PARTS) project broadens the range of natural resource issues being examined by the Africa Bureau. PARTS funds research and analysis activities, sponsors innovative research grants and networks, and disseminates research findings and information throughout Africa. In FY 1992 studies backed by the project examined three major themes:

- *Policies, institutions, and socioeconomic conditions needed to improve natural resource management.* For example, PARTS backed a review of natural resource policy reform programs and a summary of experience with land tenure.
- *Natural resource management practices and their impact on the productivity of the natural resource base.* For instance, PARTS funded an analysis of the USAID and private voluntary organization (PVO)/nongovernmental organization (NGO) partnership in natural resource management activities.
- *Environmental quality issues.* For instance, PARTS supported a study of approaches to analyze the impact of biodiversity conservation activities in Africa.

Seven collaborating PVOs, universities, and consulting firms are carrying out activities and studies related to these themes. In addition, the National Science Foundation (NSF) and the *Biodiversity Support Program* (BSP) are managing an innovative research grants component with funding from the Africa Bureau.

Two PARTS studies conducted with the *Forestry Support Program* (FSP) were completed in FY 1992. The first addressed the role of public sector institutions in natural resource management reforms in Africa.⁷² The second analyzed ten natural resource management practices used in Africa, including contour planting and game ranching.⁷³ In addition, PARTS funded a study completed in February 1992 on ecotourism in Africa, highlighting problem areas and issues as well as proposing an analytical framework for economic analysis of ecotourism activities.

To promote greater African participation in research and analysis, the PARTS project provides annual fellowships in agriculture and natural resources for African scientists and decision makers. The fellowships are awarded to African scientists interested in issues on the analytical agenda, who are then paired with USAID staff and/or research collaborators conducting research in the same theme areas. To facilitate networking among African and U.S. professionals and to provide USAID missions with a better understanding of organizations working in resource management, PARTS will publish a directory of these individuals and groups.

4.1.2 Madagascar: Policy Reform for Biodiversity Conservation

Madagascar, which contains some of the world's most important habitats for biodiversity, is the Bureau's top priority in terms of biodiversity. In FY 1992 USAID launched a major effort to bring about sustainable changes in natural resource management. The three-year, \$36 million *Knowledge and Effective Application of Policies for Environmental Management* (KEAPEM) project has three goals: to improve the array of resource management options available and to

strengthen local capacity to implement them; to reform the resource policy and pricing framework to provide better signals to resource users; and most important, to develop the belief among local people that it is in their own self-interest to manage these resources on a sustainable basis.

KEAPEM, the largest USAID environmental policy reform program in Africa, is part of a complex 15- to 20-year effort coordinated with NGO projects, the National Environmental Action Plan (NEAP), and other USAID efforts, including the *Sustainable Approaches for Viable Environmental Management* (SAVEM) project, an initiative launched in FY 1990. KEAPEM's policy reform component builds on discussions with the Government of Madagascar and other donors about the linkages between biodiversity and sustainable economic growth. It was the first nonproject assistance program designed by USAID for biodiversity conservation and served as a model for other programs in Africa, such as Uganda's *Action Program for the Environment* (APE).

KEAPEM is providing \$36 million in assistance, of which \$21 million is being used to service Madagascar's \$3 billion external debt in return for strategic policy reform and institutional reorganization. Another \$9 million is being used to provide technical assistance, short-term training and commodities in support of those policy and institutional reforms through Madagascar's newly created National Office of the Environment. Reforms to be financed include improving the collection of revenue fees from logging and setting aside a portion of entrance fees to protected areas to finance their maintenance. A national endowment fund will provide a continuous source of financing for environmental activities implemented by local NGOs. Unlike other projects, the endowment will not be financed through a debt-for-nature swap. Instead, the government will establish the endowment with \$12 million equivalent in local currency generated by conversion of the nonproject assistance grant. The endowment fund will be managed by a Malagasy foundation. This design is being closely studied by other donors.

To facilitate donor coordination, a multidonor secretariat is being housed at the World Bank, funded in part by USAID. A quarterly newsletter keeps donors informed of environmental activities occurring in Madagascar, and the secretariat is coordinating annual conferences of donors. This system has proved so successful that it has been expanded to include several other countries in Africa.

4.1.3 Ghana: Castles and Parks

USAID is backing an innovative effort in Ghana, a priority country for USAID in terms of tropical forest and biodiversity conservation. The focus is Kakum National Park, identified by Conservation International as one of 15 global hot spots for nature conservation because of its high levels of biodiversity and endemic species and the extreme pressures on them. The project will create and develop the park and restore nearby historic forts and castles.

The aim of the five-year (FY 1991-95), \$9 million *Natural Resource Conservation and Historic Preservation* project is to create jobs and stimulate the local economy, while reducing pressure on natural resources. Revenues from tourism will maintain the historic sites and park. Although neither the park nor the historic sites might attract enough tourists to be self-sustaining, the combination of ecotourism in the park, museums in the restored forts and castles, and recreation at nearby beaches is designed to increase the number of tourists and the length of their visits.

The Smithsonian Institution will develop interpretive programs for the forts and castles, which include the oldest European structure in sub-Saharan Africa, the Portuguese castle at Elmina, built in 1482. One of the forts may be partly converted into a restaurant and inn to be run by private sector interests.

As part of the project, a debt-for-nature swap purchased and received donations of blocked funds (profits from multinational corporations that cannot be moved out of the country

because of foreign exchange restrictions) in Ghanaian currency; this tripled the value in local currency equivalent of the original dollars set aside for the debt swap. These local funds are being used to finance restoration of the historic sites, development of the park, and preparation of the visitors' program. In addition, U.S. entertainers Dionne Warwick and Isaac Hayes have set up a \$20 million foundation to complete the forts' restoration.

During its first year of operation, the project has stimulated private sector investments in area hotels, food services, and resorts. Two assistant game wardens were sent to Malaysia to be trained in wildlife management methods. Activities were coordinated with other donors through a major tourism development program funded by the Government of Ghana, the United Nations Development Programme, and commercial tourism agencies.

Agricultural fields and plantations extend to the park's borders. Studies are being carried out to assess the needs and expectations of the people living in 20 surrounding villages. The studies will be used to identify the villagers' traditional use of nontimber forest products and to design appropriate development strategies to promote the coexistence of the villagers and the park. Project staff have created a community outreach program to train villagers in improved farming techniques. An inventory of plants and wildlife and preparation of reports on the natural resources of the park and buffer zone have been planned. This information will identify areas of priority management activities, help in developing management plans, and provide material for the visitors' program. A detailed environmental information base will be assembled and housed in a resource library located in the park.

4.1.4 The Gambia: Community Resource Management

Establishing and managing national parks, promoting community-managed forests and pastures, and improving soil fertility are the goals of the five-year, \$22 million *Agriculture and Natural Resources Management* project launched in FY 1992 in The Gambia.

Technical assistance and policy interventions are designed to support the implementation of the 1992 Gambia Environmental Action Plan. Some \$10 million (conditioned on legislated changes involving land tenure and resource policies) will help The Gambia repay its external debt. Another \$12.5 million in planned project activities will promote the adoption of community resource management agreements, which share control and management rights between the government and local villages. The project will support agroforestry, biodiversity conservation, fisheries management, and tropical forest protection.

4.2 Ongoing Projects

During FY 1992–93 a broadly targeted USAID project to support natural resource management in Africa continued to make progress, as did several ongoing country projects in Rwanda, the Congo, Mali, and countries in southern Africa.

4.2.1 Mission and NGO Support

The six-year (FY 1987–93), \$22 million *Natural Resources Management Support* (NRMS) project has served as a catalyst to encourage missions, other donors, PVOs, and NGOs to initiate or expand their support for biodiversity, forestry, and other natural resource management activities in Africa. During the life of the project, USAID funding for natural resource management projects in Africa has more than doubled, from \$44 million in FY 1988 to \$95 million in FY 1993. The project has also helped disseminate lessons learned on such topics as tenure issues and the decentralization of resource management. In addition, the project funded a regional program to support the work of NGOs and PVOs in natural resource management. The project concluded most of its activities in FY 1992. Major accomplishments over the life of the project have included:

- increased USAID and African capability in natural resource analysis and program implementation,

- greater institutional capacity of nearly 300 African nongovernmental organizations (NGOs) to develop and implement natural resource projects and programs,
- increased understanding of the role and importance of biodiversity and its relation to rural development through support of a series of biodiversity intervention studies,
- developing bilateral natural resource management projects and programs within the context of USAID mission development programs,
- special studies, analyses, and workshops for missions and NGOs, and
- key analytical work to assess natural resource management program impacts as required under the Development Fund for Africa (DFA).

The PVO-NGO component of NRMS has enhanced the technical and organizational capacities of PVOs and NGOs working in natural resource management. The project's cooperative agreement with three PVOs—World Learning Center, CARE, and World Wildlife Fund (WWF)—supported new approaches to improve soil fertility and vegetative cover, integration of sustainable development activities and conservation in buffer zones around national parks, and improvements in local NGO technical and managerial skills. Officials of more than 300 PVOs and NGOs in the four focus countries participated in project-sponsored national coordination committees, technical symposiums, and workshops, which trained hundreds of mid-level African NGO community-resource managers in environment and natural resource management skills.

During FY 1992–93, several major activities were undertaken via the PVO-NGO NRMS.

- In March 1993 the project published a multicountry assessment, based on fieldwork done in 1992,⁷⁴ of African NGOs working in natural resource management. Using such indicators as NGO experience and needs, government policy and institutional support, and government and donor trends, the analysis ranked countries according to their potential for future PVO-NGO/NRMS-style activities that could be undertaken

by USAID or other donors. Of the 18 countries, 12 offered strong opportunities for NGO work in natural resource management.

- A workshop, the "Training Seminar on Environmental Information," was funded by USAID and organized by the Paris-based office of the international NGO, the Panos Institute, in June 1992, bringing together representatives of the media and the NGO community. Its purpose was to improve the media's knowledge and analyses of natural resource management issues and NGO approaches to addressing them. Participants included newspaper, radio, video, and theater representatives who visited NGO project sites. Articles, radio shows, a play, and a video were produced, presented, and discussed during the course of the workshop; a summary publication is in progress.
- In preparation for the Global Forum NGO meeting that occurred simultaneously with the Earth Summit in Rio de Janeiro in June 1992, the four PVO-NGO/NRMS country coordinators jointly reviewed and analyzed their work in the four focal countries and disseminated lessons learned to USAID and NGOs in Washington. In Rio de Janeiro, each country coordinator presented the activities of NGOs in natural resource management. The coordinators received feedback on methodology and program implementation and information on other NGO approaches to natural resource management around the world.
- Ways to improve livelihoods in Africa's pastoral sector and to help herders sustainably manage natural resources were assessed. A manual entitled *Non-Governmental Organizations and Natural Resource Management in Africa's Pastoral Sector: Where to Go from Here?*⁷⁵ synthesizes the findings of two background assessments and a workshop on African pastoralism.
- To help develop a strong network of conservation experts and leaders in southern Africa and to share natural resource management methodologies, the project (through WWF) held a February 1993 workshop in Zimbabwe for 20 managers of community-based natural resource management programs in eight countries.

Other PVO-NGO/NRMS activities in FY 1992-93 included:

- two workshops on integrating women in natural resource management,

- workshops on agroforestry, project development, and proposal writing,
- technical assistance to help a Malian NGO design contour dikes,
- an analysis of NGO opportunities to integrate natural resource management more effectively into irrigation planning,
- monitoring an Africare program in Mali that rents chain-link fencing to communities to protect their gardens from sheep and goats while a living fence consisting of closely spaced thorny shrubs is planted and takes root (once the living fence is well established, the metal fence is rented to another community), and
- publication of *Designing Integrated Conservation and Development Projects*,⁷⁶ which analyzes how conservation and development objectives can be integrated with the dual goals of improving natural resource management and improving quality of life—a joint effort with WWF's Wildlands and Human Needs Program and the Biodiversity Support Project.

Another component of the NRMS project funded small biodiversity grants to support activities, research studies, and pilot activities (mainly in parks) that have led to full-scale bilateral projects. For example, an activity in the Tsavo West National Park in Kenya addressed the problem of cattle grazing in the park. Masai communities were encouraged to cooperate in park conservation by grazing cattle only in adjacent areas. Steps were taken to develop options for the Masai to benefit directly from wildlife management through wildlife tourism initiatives (safaris and tented camp concessions) and nontourism initiatives (beekeeping and hay sales). In FY 1991, a \$450,000 follow-on project was approved to develop conservation and local development activities from a percentage of tourist gate receipts, which are being channeled to local communities.

In addition, a NRMS grant to the Wildlife Conservation Society (formerly Wildlife Conservation International) for pilot research and conservation activities in the Nyungwe forest reserve in Rwanda led to the incorporation of the reserve in the USAID *Natural Resource Management Project* (NRMP) in Rwanda. An additional USAID-funded, four-year, \$6 million

project, *Natural Resource Management*, has been designed to continue the work in forest conservation (see p. 104).

Another notable NRMS achievement was creating a Natural Resources Management Framework to monitor the impact of USAID-funded activities. The framework has been put to use and refined under the PARTS project. It is quickly becoming an important tool for monitoring the Africa Bureau's environment and natural resource projects; seven missions have used it to design and/or monitor their projects. An ongoing Bureau study of institutional structure and reform is also using the framework to examine the requirements of effective natural resource management agencies. Moreover, the framework is now being used by the USAID Center for Development Information and Evaluation in evaluating the entire Agency's environment and natural resource portfolio.⁷⁷

4.2.2 Southern Africa: Living with Wildlife

Helping local communities share the benefits of protected areas is the aim of the \$38.5 million, seven-year (FY 1989-95) Southern Africa Development Coordinating Committee (SADCC) *Regional Natural Resources Management* project. Its premise is that if protected areas benefit rural communities, villagers will protect the resources and help prevent outsiders from poaching wildlife and cutting timber.

The project operates at local, national, and regional levels. Overall, the program compensates local communities for damage to crops caused by wildlife, as well as foregone subsistence opportunities such as hunting and grazing in the parks. Compensation is given occasionally through direct cash payments but more often by helping communities establish viable enterprises that use natural resources sustainably. Newsletters, annual workshops, research, and the publication of results disseminate project information regionwide.

The project is implemented through a number of country-specific components, which adapt common themes to national variations. Activities are under way in Botswana, Namibia, Malawi, The Zambia, and Zimbabwe. In the border regions shared by Botswana and Zimbabwe, conserving and protecting elephants is a major objective of project activities. The five-year (FY 1989–94), \$8 million Zimbabwe component is working to establish a management system in which rural communities and wildlife can coexist. Implemented by three NGOs—Zim Trust, the Center for Applied Social Studies, and WWF—the project provides local communities with revenue from hunting safaris, jobs through an antipoaching program, and compensation for crops damaged by wildlife. Cottage industries using natural resources, such as beekeeping and handicrafts, are also being promoted. Local awareness of the need for resource management and conservation at the community level is increasing, according to a FY 1992 assessment.

In Botswana, the nine-year (FY 1988–96), \$7 million component promotes community-based wildlife utilization through various means: tourism, hunting, research, environmental education, processing and marketing of animal products, and use of grassland and forest products. In FY 1992 project staff began a series of conservation workshops for teachers and produced radio broadcasts to support the themes of Botswana's National Conservation Strategy.

The Botswana component also has promoted policy reform, resulting in two critical laws related to natural resources: a tourism act and a wildlife conservation and natural parks act. USAID authorized \$5.9 million to fund a field-based, community-focused extension service and to help strengthen the Department of Wildlife and Natural Parks.

In The Zambia community-based efforts are also under way in a six-year (FY 1990–95), \$3 million project. In Namibia the USAID mission has been instrumental in promoting national legislation to enable rural communities to retain the benefits of natural resource management initiatives. Community-based initiatives are one emphasis of the five-year, recently authorized \$11 million *Living in a Fragile Environment* (LIFE) project. In Malawi baseline studies of

wildlife and socioeconomic surveys of the residents and institutions in the project area are under way. This \$1.5 million component also facilitates and coordinates efforts in Botswana, Namibia, The Zambia, and Zimbabwe.

4.2.3 Cameroon: Genes from the Wild

Increasing the harvest of important food crops in West and Central Africa was the focus of the seven-year (FY 1986–92), \$9.2 million *Roots and Tubers Research Project* (ROTEP). The effort aimed to foster genetic improvements in yams, cassava, and cocoyams grown for food in Cameroon and other parts of Africa. In particular, wild relatives of these plants that are resistant to diseases—which cut levels of production or kill the plants—were sought.

The project was implemented in Cameroon by a consortium of three historically black U.S. universities—the University of Maryland–Eastern Shore, Alabama A & M University, and Florida A & M University—and Cameroon’s Institute of Agronomic Research. Cameroon national’s were trained through short-term courses, graduate-level training, and fellowships.

The project maintained and utilized genetic diversity from the wild to improve the supply of important food crops and reliability of their production. Wild varieties of plants were collected from numerous locations in Cameroon, Ghana, Togo, and Central America to screen for their resistance to the organisms that cause the diseases.

4.2.4 Rwanda: Biodiversity and Sustainable Agriculture

Sustainable agriculture is a priority for USAID in Rwanda, a mountainous country whose steep hillsides are covered by small farms. Soil erosion, a rapidly expanding population, and loss of natural forests and animal habitats are major problems. In addition, Rwanda’s unique wildlife is threatened by the expansion of agriculture and poaching.

The three-year (FY 1989–91), \$10 million *Natural Resource Management Project* (NRMP) is designed to enable USAID to focus on three natural resource issues of critical importance to Rwanda: resource conservation, sustainable production, and institutional development and planning.

The project supports research; training; natural forest management and protection; fish farming to conserve wetlands; agroforestry and soil conservation in conjunction with hillside farming; and environmental planning, policy development, and coordination.

All of the components reported substantial progress in FY 1992. For instance, in an effort implemented by AFRICARE, some 750,000 tree seedlings were distributed to farmers and 55 extension agents were trained in agroforestry. Nearly 60 nurseries are producing seedlings for the project.

Special efforts have been made in the Nyungwe Forest Reserve. An ecotourism program featuring black and white colobus monkeys and the development of hiking trails and camping facilities has generated a great deal of interest, publicity, and enthusiasm about the forest. The project includes a conservation education program in neighboring villages. Through such activities, many of the fears and superstitions about tropical forests have been dispelled. Local communities are involved in the tourism activities, and an emphasis on training for guides, trackers, and trail workers has earned these people a reputation as some of the best nature tourism staff in the region.

Several studies about the Nyungwe reserve were completed in FY 1992, including inventories of plants, birds, and primates; a socioeconomic analysis of the surrounding communities; and a study of the impact of gold mining on the reserve—the only such report in Africa. Studies underway examine mountain gorillas, trace the link between animal seed dispersion and forest regeneration, and investigate the pattern and impact of crops in the

reserve. Various studies support conservation efforts and provide baseline data for a research strategy that will tie in with the forest management plan. A four-year, \$6 million follow-on project, *Natural Resource Management*, has been planned to continue the conservation education program, protect the remaining elephants, and promote ecotourism.

The Rwandan National Environmental Service (SNE) is implementing the NRMP project's environmental planning, policy development and coordination component. In FY 1992, with USAID financial and technical support, SNE organized workshops, conferences and seminars for NGOs, the media, teachers, and government staff on a wide variety of topics to increase public awareness about the environment. To avoid duplication of efforts, SNE organized a donor coordinating committee for Rwanda's environmental program and participated in a major donor round table in Geneva to coordinate funding for implementing the country's Environment Action Plan.

4.2.5 The Congo: Habitat Protection

In a remote corner of northern Congo where the borders of the Congo, Cameroon, and the Central African Republic converge, special efforts are under way to protect an area rich in biodiversity. The four-year (FY 1991-93), \$1.9 million *Conservation of Northern Forests* project, implemented by the Wildlife Conservation Society, centers on the establishment of the Nouabale-Ndoki National Park, the first national park created by the Congo since independence. The 448,000-hectare park will protect the headwaters of three major watersheds in the area as well as populations of forest elephants, gorillas, chimpanzees, leopards, and pangolins (scaly anteaters), currently under threat from logging operations. The Congo is one of USAID's priority countries in terms of conserving biodiversity and protecting forests to ameliorate the effects of global climate change. In addition, northern Congo is home to one of the priority populations of elephants identified for conservation in the African Elephant Plan (see box 4.1).

Box 4.1

Conserving Africa's Elephants

The African elephant is the largest living land mammal and a symbol of the continent itself. Elephants, historically valued as a source of ivory, leather, and meat, have also become prime attractions for tourists. Nature tourism, in which elephants play a major role, contributed an estimated \$200 million annually to the economy of Kenya during the 1980s, representing one of the country's most important sources of foreign exchange.⁷⁸

Forest elephants and savanna elephants, two subspecies, occupy a variety of habitats and play important roles in the ecosystems in which they live. Forest elephants aid natural forest regeneration by dispersing the seeds of important timber species. By forging trails in heavily wooded areas and pushing over dead trees, forest elephants permit new growth and help regulate the composition of vegetation, which in turn benefits other species. Elephants are also important to the health of savanna ecosystems. In Tanzania's Tarangire National Park, for example, as savanna elephant herds dwindled during the 1970s, brush thickets sprang up. As a result, the population of tsetse flies soared, spreading disease among the region's domestic livestock.⁷⁹

The population of African elephants has fallen with alarming speed. In little more than one decade, the total number fell by half to its current level of less than 600,000. In some East African countries, up to 92 percent of the elephant population was lost between 1973 and 1989. Loss of habitat contributed to the decline, but the primary cause was the trade in ivory; legal and illegal exports reached 1,000 tons per year, representing an annual loss of 80,000 elephants.⁸⁰ Imports of ivory into the United States, which accounted for 10 to 15 percent of world trade, ceased in 1989; a global ban took effect in 1990.⁸¹

The trade ban, which the U.S. government supported, and subsequent efforts toward elephant conservation and suppression of poaching have effectively eliminated demand for ivory and halted the rapid decline in elephant populations. Ivory markets have collapsed;⁸² analysts predict that the trade ban will continue to be an effective means of suppressing poaching.⁸³ Kenya, which lost 3,000 to 5,000 elephants per year before the ban, lost 55 in 1990 and only two during the first nine months of 1991.⁸⁴

To promote African elephant conservation, USAID invested more than \$10 million for African elephant conservation in eight countries in FY 1992—well over the Congressional earmark of \$7 million. Through an Interagency Advisory Committee on the African Elephant, USAID coordinates its elephant program with other U.S. government agencies, including the Fish and Wildlife Service, the Peace Corps, and the Departments of State and Defense.

USAID activities in elephant conservation focus on managing critical habitats and enabling nearby human communities to coexist better with elephant herds. This approach fosters economic development in rural areas and has the added advantage of conserving ecosystems, which benefits many more species than elephants alone.

USAID-funded projects with elephant components discussed elsewhere in this report include the Conservation of Northern Forests project in the Congo (see p. 106); the Conservation of Natural Resource and Historic Preservation project in Ghana (see p. 96); and the Southern Africa Development Coordinating Committee (SADCC) Regional Natural Resources Management project with activities in Botswana, Malawi, Namibia, The Zambia, and Zimbabwe (see p. 102). Additional USAID projects with elephant components include: Korup National Park in Cameroon, Park "W" in Niger, the Conservation of Biodiverse Resource Areas (COBRA) project in Kenya, and the Action Plan for the Environment (APE) in Uganda (see p. 15).

USAID also focuses on policy and planning issues such as in the Tanzanian *Planning and Assessment for Wildlife Management* (PAWM) project. Managing elephant herds and solving management problems often require cooperation and coordination between neighboring countries because the elephant's range frequently crosses national boundaries. In FY 1988 USAID support through the African Wildlife Foundation established the African Elephant Coordinating Group, which drafted an African elephant action plan in coordination with national governments, donors, and nongovernmental organizations.

The coordinating group identified 49 critical African elephant populations urgently needing protection and, with USAID support, has now completed national African elephant action plans for 34 countries. Representatives of elephant range states and donors, including USAID, met in Nairobi in January 1992 to discuss the plans and coordinate activities.

USAID recognizes that Asian elephants are also threatened throughout their range and has recently funded two activities involving Asian elephants: an Asian elephant research study in Thailand and an elephant component in the *Mahaweli Agriculture and Rural Development* project in Sri Lanka.

Adding urgency to the establishment of the park are the variety of threats facing the area. Elephant poaching is a major source of revenue for nearby villagers and poachers from Cameroon and the Central African Republic. The park is surrounded by logging concessions that extend to the park borders. A major road planned for the region is currently on hold

because of a temporary lack of funds. In addition, drought and overgrazing to the north have forced people to migrate southward, ever closer to the forest.⁸⁵

In FY 1992 progress occurred on several fronts. A Congolese environmental law professor drafted legislation to gazette the park, which the government is reviewing. *Time* magazine featured the park as a cover story in July. Three Peace Corps Volunteers conducted applied research activities in the area, including an assessment of the impact of logging and hunting on area wildlife, a detailed study of a unique type of forest, preparation of a vegetation map, and a survey of neighboring villagers about their current attitudes to wildlife and hunting and their awareness of the project's goals.

Regular public meetings in the two surrounding villages foster discussion and help to resolve problems. As a result, the villagers have agreed to phase out elephant hunting as jobs and other benefits are created by the project.

A conservation education program is addressing issues at the local, national, and regional levels, including radio interviews of the project director and staff that are broadcast throughout Central Africa, a monthly program on Radio Congo and a quarterly newsletter. A meeting with the military, held because of the army's potentially negative impact on the region's wildlife, began a good relationship between them and project staff.

Ongoing coordination with other projects in the area includes work with Dzanga-Sangha park, which is just across the border in the Central African Republic. The project has arranged for the elephant researcher there to conduct similar studies in the Congo. Plans also call for the Congolese park guards to be trained at Dzanga-Sangha. A formal working agreement has been arranged with Japanese primatologists working nearby. A satellite map of the trinational area, prepared by National Aeronautics and Space Administration (NASA) for a project supported by the Biodiversity Support Program, has led to planning for collaborative work on a geographic

information system. To help in planning management of elephant herds throughout the region, the project is conducting genetic studies to determine how forest and savanna elephants differ.

The project emphasizes on-the-job training of field technicians, provision of field experience for biologists and university students in other natural resource areas, and training of government staff. USAID sponsored an environmental law professor's participation in a workshop on the legal aspects of environmental conservation in developing countries.

Future activities include media campaigns to publicize the park. The National Geographic Society produced a film and a magazine article about the Ndoki forest, and arrangements are under way for the production of a book about the area. A wildlife reserve will be created within a logging concession to serve as a buffer zone on the southern border of the park.

4.2.6 Mali: On-Farm Tree Planting

A long-running forestry project in Mali is demonstrating the benefits of reforestation. The ten-year (FY 1983–92) \$3 million *Village Reforestation* program had modest beginnings. The original pilot project was designed to test the hypothesis that small-scale programs to plant trees at the village level would be both more cost-efficient and effective than large-scale industrial programs in increasing both tree cover and the supply of wood products in arid and semiarid areas. In addition, the project aimed to help Mali's Forest Service evolve from a forest police force to a forest extension service.

What began as a five-year effort in FY 1981 has been extended twice. Over the course of the project, activities shifted to focus on tree planting by farmers on their own land when the community woodlots proved to be neither socially nor economically viable. The project has maintained discussions on changing a system in which Forest Service agents impose fines on villagers and keep a percentage of the fines to pay their own salaries—a legacy of the French colonial system. Discussions will continue in the next project.

As a result of increased awareness about the value and benefits of trees, villagers have planted and now protect useful indigenous trees to supplement the exotic species provided by the project. Individual farmers have established mini-nurseries on their garden plots, which provide income and increase the supply of seedlings in the area. To provide poles for construction, farmers are now establishing and managing small woodlots. Research carried out in conjunction with the project has demonstrated the dramatic effects on tree growth of using water-harvesting techniques, intercropping, and large planting holes.

A five-year (FY 1994–98) \$7 million follow-on project, the *Mali Environmental Support Program*, has been designed, drawing on lessons learned from the earlier effort. The new program will combine an improved process for policy and decision making with field interventions on small farms. Natural forest management, environmental monitoring, and on-farm soil conservation activities will be emphasized. The forestry code will be revised; a media campaign will inform the public about the new code; pricing and permit policies for the sale of firewood will be reformed; and a village land use planning process will be implemented.

4.2.7 Regreening the Hills of Cape Verde

The Cape Verde Islands, 400 miles off the coast of Senegal, form the most westerly extension of the Sahel. The islands were colonized by the Portuguese in the 15th century, and much of the original vegetation was degraded as an expanding population tried to farm and raise goats in the semiarid environment. Droughts and famines at regular intervals led to large-scale starvation; many people migrated to other countries in search of food, water, and work. Soil erosion and water runoff are serious problems on the islands where half the year's rain may fall in a single storm. In recent decades, Cape Verde's economy came to depend on foreign assistance and remittances sent back to the families of people who had migrated elsewhere. The future looked bleak; however, through the efforts of USAID, the international donor community, and the people of Cape Verde over the past 15 years,

extensive tree planting and soil and water conservation have contributed to increased agricultural productivity and restoration of the barren landscape.

A three-year (FY '985-87), \$6 million USAID-backed effort, the *Cape Verde Watershed Development* project, rehabilitated 13 watersheds on Santiago, the largest island of the archipelago, using soil and water conservation structures, water-harvesting techniques, and reforestation. A series of small dams and rock walls were built, and grass, trees, and shrubs were contour-planted on the hillsides to stabilize the slopes, controlling both water runoff and soil erosion during the rainy season. Small reservoirs capture rainfall for use in crop production throughout the long, hot, dry season. An agroforestry component combines trees and crops on the hills to protect the soil, to regulate water flow, and to provide water for livestock, firewood for cooking, and poles for building, while increasing crop and fruit yields.

On Santiago, 13 watersheds covering 18,000 hectares have been rehabilitated using soil and water conservation structures, water-harvesting techniques, and reforestation. A series of small dams and rock walls were built, and grass, trees, and shrubs were contour-planted on the hillsides to stabilize the slopes, controlling both water runoff and soil erosion during the rainy season. Small reservoirs capture rainfall for use in crop production throughout the long and dry hot season. Through an agroforestry component, trees and crops were combined on the hills to protect the soil, to regulate water flow, and to provide forage for livestock, firewood for cooking, and poles for building, while increasing crop and fruit yields. Overall, the project planted 5.6 million trees and built 4,000 rock dams and gully plugs, 1,500 kilometers of rock walls, 22 catchment dams, 28 reservoirs, and 33 kilometers of canals and pipelines. More than 500 people participated in a variety of training and extension programs. The project organized community work groups as well as the first outreach program in Cape Verde specifically addressing the needs of rural women.

4.2.8 Managing Natural Resources in Semiarid Senegal

On the edge of the Sahara, Senegal is taking steps to restore and increase tree cover. Forestry and agroforestry practices are central to efforts to buffer the land from desiccating heat and wind in the semiarid, northern half of this mainly rural country located in one of the world's poorest regions.

USAID supports a variety of efforts promoting sustainable forestry and natural resource management in Senegal. These efforts have grown in sophistication as knowledge has increased about natural resource management in semiarid regions. For instance, USAID has learned that plantations, especially eucalyptus plantations—which were promoted in the late 1970s to provide fuelwood—do not always succeed in dry regions; sometimes natural forests can outperform plantations at a much lower cost because the trees are adapted to the climate and soil conditions. Today, USAID is focusing on agroforestry and community-based forestry, particularly efforts to benefit small-scale farmers, who are key agricultural producers. In addition, USAID is working with the Government of Senegal and groups throughout the country to tackle basic legislative reforms to promote sound management of the natural resource base.

Many USAID activities in Senegal focus on planting trees to reverse soil degradation and slow erosion. For instance, a matching grant program for farmers to plant trees—part of the \$14 million *Senegal Reforestation Project*—has encouraged on-farm tree planting on a wide scale. The grants pay farmers half the calculated costs of planting a tree, including materials and labor. The cost-sharing technique aims to overcome farmers' traditional hesitation to risk using new methods. At the same time, farmers gain a vested interest in the survival of seedlings because they have contributed time, labor, and their own land to the program. The program induced 43,000 participants—nearly 60 percent of them women—to plant trees on 1,300 hectares in FY 1991—more than one-quarter of the target area for the nine-year project in one year. Although the immediate infusion of cash has been an economic motivation for planting trees, a FY 1991

mid-term evaluation of the program found that some trees were also being planted for more than the immediate economic incentive. Trees were regarded by the poor as bank accounts or investments for their children's education or inheritance.

The evaluation also found that the matching grant system, although effective, did not reward farmers for protecting naturally regenerating trees—the most cost-effective method of increasing tree cover; thus the evaluation of the reforestation project recommended an alternative formula to reward farmers for protecting naturally regenerating trees, as well as for planting new trees. The evaluation also strongly suggested increasing research on native species and incorporating them into the planting program. These recommendations have been integrated into the follow-on to the Senegal Reforestation Project, the seven-year (FY 1993–99), \$25 million *Community-Based Natural Resources Management* (CNRM) project, which will also support agroforestry.

Fostering the growth of small business is one of the Senegal Reforestation Project's important aims. A roadside planting component contracts with small businesses to plant trees along designated roads. Both the roadside program and the matching grant component have dramatically increased the demand for seedlings, spurring the creation of private nurseries as a spin-off industry. The project is also promoting a market information system run by Senegal's Forest Service so that agents can extend forest product market information and advice to farmers and coordinate activities among producers, middlemen, and consumers. Studies address such topics as financial and economic analyses of agroforestry, land and tree tenure, soil conservation, and the lack of information about marketing.

Over the next few years (FY 1992–97), USAID will focus on working with community groups and farmers to plant three million trees and protect and manage natural forest regeneration on 200,000 hectares of land. A related policy- and institution-strengthening component will deregulate the markets for tree products, establish a market

information system, strengthen regional markets for forest products, and promote high-value products, such as cashews, for markets at home and abroad. It is expected that agroforestry techniques supported by the project will improve food security and increase supplies of tree products, boosting incomes for as many as 50,000 rural households. Because women play a significant role in cultivating, harvesting, and processing activities, they are expected to be major beneficiaries of USAID's natural resource management strategy.

Reforming natural resource policies is an important aim of USAID activities in Senegal. As part of the CNRM project, project staff will work with the government to develop a national environmental action plan (NEAP) that will create a multiministerial policy framework to streamline the multitude of existing policies and regulations on the environment and natural resources. A policy review has identified constraints that will be addressed in the NEAP process.

USAID has launched a companion three-year (FY 1992-94), \$30 million effort, the *P.L. 480 Title III Natural Resources Policy Reform* project. This project is promoting a new forest code that recognizes private property rights over trees that farmers plant on their farms. This extends the legal basis for efforts to expand community forestry and agroforestry. The code also allows the Government of Senegal to cede ownership and management rights for natural forests and planted trees to rural communities, which can either sell the trees or use them for local consumption. The establishment of a national secretariat for natural resource management is planned to conduct resource management analyses and develop a national resource management plan in cooperation with the private sector and rural communities. A monitoring system is also planned to measure the impact of forestry code reforms on soil, land use, retail prices, and other related matters.

The CNRM project will undertake activities at the local and national levels and promote applied research and training. Village and community leaders will receive training

to enable them to develop and implement community-wide conservation plans. The research program will emphasize adaptive natural resource technologies relevant to small farms. Forestry research will emphasize indigenous and exotic species; natural regeneration, agroforestry techniques; sustained-yield, wood-harvesting techniques; market development for tree and wood products; and forest economics. The economic and social benefits of on-farm conservation and tree-planting activities will be studied. The results of research on agroforestry and other conservation techniques will be available from Senegal's Agricultural Research Institute, now being funded by USAID's *Natural Resources-Based Agricultural Research* project.

Chapter 5

USAID Activities in Asia

More than 40 percent of the planet's species of flora and fauna and two-thirds of the world's coral reefs are found in Asia and the Pacific.⁸⁶ The region also supports more than half the world's five billion people, a number that will expand by an estimated 1.7 billion in the next 35 years.⁸⁷ Pressures on the region's rich genetic endowment are increasing. Rapid and extensive changes in the natural systems of Asia not only pose severe threats to the region's biodiversity but are also undermining its potential for economic development.

Even though the region has enjoyed relatively high economic growth over the past two decades, decisions to balance economic growth with prevention of further environmental degradation have been few. The population explosion and land tenure laws are perpetuating conversion of forests to agricultural and grazing lands, whereas the absence of clear and firm forest policies to mobilize public support for effective forest management has contributed to the failure of forest management in many areas. Government policies designed to extract wealth rapidly from the landscape have also fostered forest conversion and degradation.⁸⁸ Forest conversion and degradation have also been accompanied by other environmental stresses—soil degradation, overcultivation of fragile lands, air and water pollution, destruction of coral reefs, overharvesting of fisheries, and introduction of exotic species, among others. At the current rate of harvesting, Asia's timber reserves are predicted to last fewer than 40 years; loss of forested areas is estimated to hasten the extinction of one-quarter of the world's biological resources.⁸⁹

As demand for natural resources rise and pressures on ecosystems intensify, urban and industrial pollution and the destruction and degradation of the region's natural resource base are projected to increase. The resulting environmental impacts are perhaps more

prominent in the newly industrialized countries; however, the problems and issues are common to virtually every country in the region. Redefining development goals to include long-term conservation of natural resources remains the major challenge for Asian countries. USAID is committed to assisting Asian countries in their efforts to salvage and manage natural resources for their long-term role in supporting sustainable development.

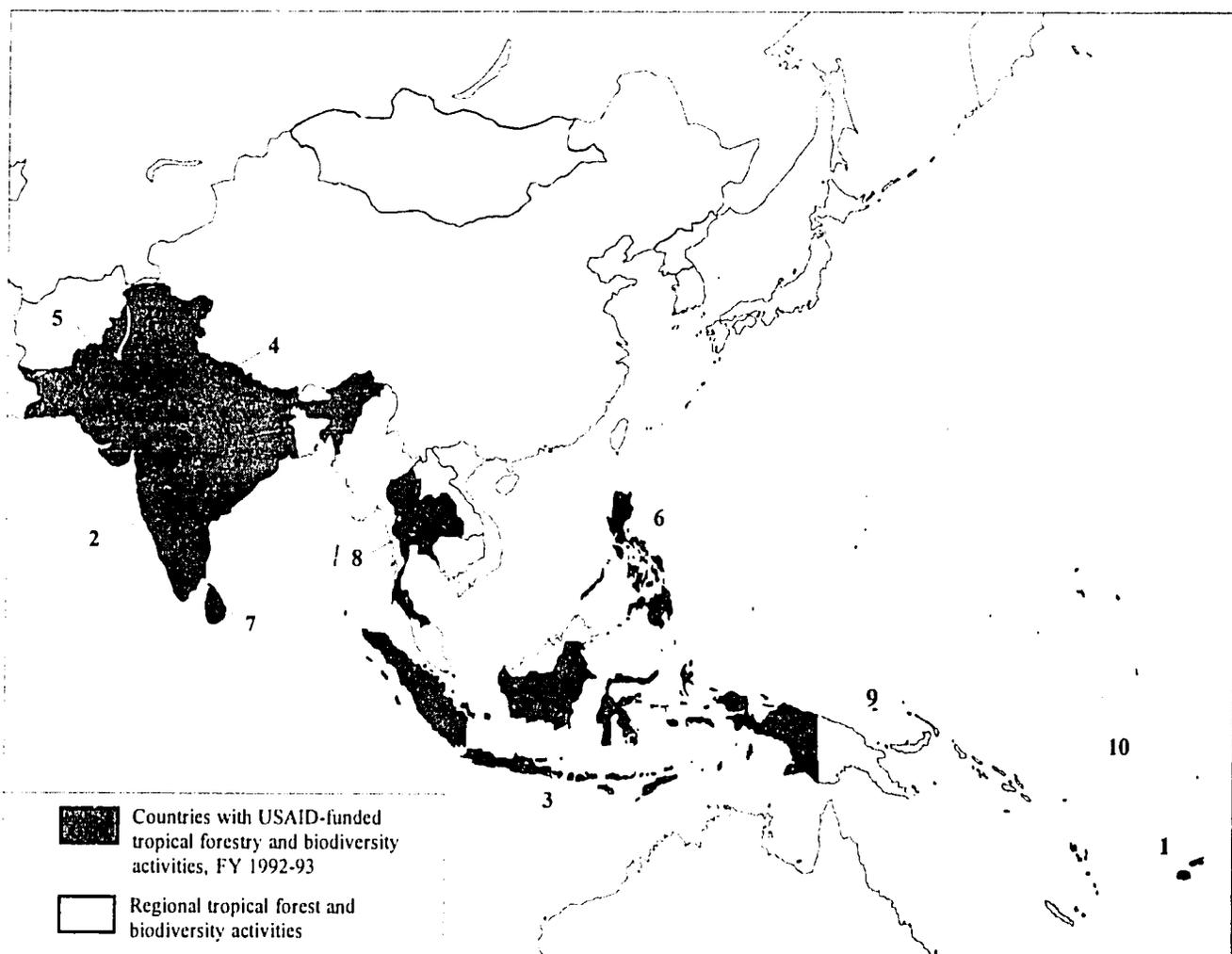
Bureau strategy for biodiversity and forest conservation. To this end, USAID's Asia Bureau has selected conservation of tropical forests and biodiversity as one of its priority action areas. Within the region, six USAID countries—Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka, and Thailand—as well as selected countries in the South Pacific have identified loss of tropical forests and biodiversity as a priority mission concern. With a range of national and international partners, USAID is playing a lead role in supporting a variety of environmental management endeavors that influence major policy and institutional reforms.

Funding trends. The distribution and funding levels of the Asia Bureau's tropical forest and biodiversity conservation program are shown in Figure 5.1. Forest conservation activities have dominated the portfolio peaking at roughly \$46 million in FY 1990 with the initiation of large projects in the Philippines and Indonesia. By FY 1992 and FY 1993 funding declined as obligations for the Philippines project neared its maximum authorized level.

5.1 New Activities

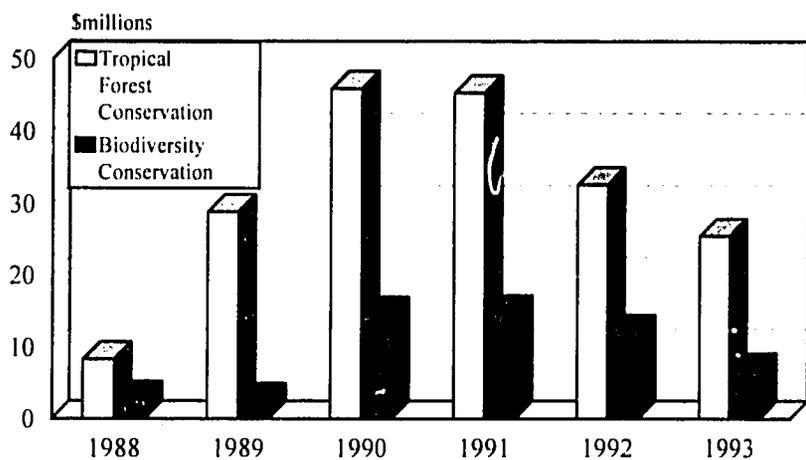
In FY 1992 USAID launched a major program in Asia, the United States-Asia Environmental Partnership, which promotes the use of innovative technologies and strategies in balancing economic growth with protection of the environment, often through transnational and public-private partnerships.

**Figure 5.1: Bureau for Asia,
FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations**



FOR USAID INTERNAL USE ONLY

**Bureau Totals
Fiscal Years 1988-93**



Geographic Distribution (\$000s)

	1992	1993
1 Fiji	180	180
2 India	4050	0
3 Indonesia	1345	1320
4 Nepal	758	2066
5 Pakistan	0	0
6 Philippines	32121	18738
7 Sri Lanka	82	221
8 Thailand	0	631
-- Regional Projects		
Asia	3376	5941
9 Papua New Guinea	--	--
10 South Pacific	1321	628
Total	43,233	29,725

5.1.1 United States-Asia Environmental Partnership

The five-year (FY 1992–97), \$100 million *United States-Asia Environmental Partnership* (US-AEP) program has two aims: to help Asian countries restore and protect their deteriorating environmental systems and to achieve sustainable economic development by mobilizing U.S. expertise, technology, and financial resources. With US-AEP as the catalyst, U.S. business, community, and government organizations and their Asian counterparts are forming partnerships to seek solutions to issues that span environmental, developmental, and business matters and to leverage each partner's resources. USAID serves as a primary source of funding for this effort.⁹⁰

The US-AEP consists of four major components: professional and organizational development, technology cooperation, environmental and energy infrastructure, and biodiversity conservation.

US-AEP undertakes activities to assist the people of Asia and the Pacific in analyzing and utilizing their unique and valuable natural forest and marine resources as well as conserving the region's biodiversity. The six-year, \$22.5 million Biodiversity Conservation Network (BCN) is being implemented in partnership with the *Biodiversity Support Program* (BSP), a consortium of World Wildlife Fund (WWF), The Nature Conservancy (TNC), and World Resources Institute (WRI) (see also section 3.2.2). Through a competitive grants program begun in the spring of 1993, BCN is strengthening the capacities of local communities, nongovernmental organizations (NGOs), government agencies, enterprises, universities, and similar organizations to use natural resources sustainably, while conserving biodiversity and genetic materials for medicines, crop improvements, and other new products. As of July 1993, BCN had received nearly 100 proposals and had approved planning grants to three groups—one each in Indonesia, the Philippines, and Papua New Guinea. Plans are under way to establish a BCN office in the region.

In addition to BCN, US-AEP has led two natural resource management efforts to conserve biodiversity in the Philippines. The first will help protect the last old-growth, low-elevation forest on the island of Luzon and its watershed located within the former Subic Bay Naval Base. A coordinator at the Subic Bay Metropolitan Authority responsible for natural resource management issues at Subic Bay has been funded through the U.S. Forest Service and WWF; a Peace Corps Volunteer will assist the coordinator.

Second, under an agreement with US-AEP, the National Association of State Development Agencies awarded a \$20,000 matching grant to the Minnesota Trade Office, in cooperation with Bio-Pak Super Absorbent, Inc., to reseed extensive tracts of deforested land around Mount Pinatubo using tree seeds encapsulated in jackets that contain a fertilizer and water-retaining material.

5.2 Ongoing Projects

USAID continued to make progress in several important projects in India, the Philippines, Indonesia, and the South Pacific.

5.2.1 India: Plant Genetic Resources

As USAID's largest biodiversity activity in India, the eight-year (FY 1988-95), \$19 million *Plant Genetic Resources* (PGR) project is designed to promote advances in agriculture by strengthening the capacity of the National Bureau of Plant and Genetic Resources (NBPGR) to preserve the rich genetic diversity of the nation's plants. Specifically, the project coordinates a comprehensive national, germ-plasm system to explore, collect, preserve, evaluate, and exchange crop-plant germ plasm as well as to enhance India's capacity in conservation and use of plant and genetic resources.

The project is currently funding construction of a new headquarters for NBPGR in New Delhi, which includes an international training center and a national gene bank with the

capacity to house and protect samples of exotic, indigenous, and other varieties of food and fiber crops, grasses, legume species, and medicinal and aromatic plants.

Part of the project involves an extensive inventory of the more than 120 germ-plasm collection units in India and an upgrade of their collections. Samples collected from NBPGR's regional stations, base centers, and field sites, along with 100,000 samples from other cooperating institutions of the Indian Council of Agricultural Research, are being incorporated into the central gene bank.⁹¹

To strengthen NBPGR's institutional capacity, earlier this year USAID sponsored 16 Indian scientists for U.S.-based professional development and short-term technical training in key areas of genetic resource management.⁹² Two U.S. scientists reviewed the need for setting up a computerized, germ-plasm, data base management system at NBPGR. The project has provided a wide range of equipment. Over the next three years, the project will help NBPGR conduct collaborative research studies, construct quarantine greenhouses, and organize special training activities.

5.2.2 The Philippines: Natural Resources Management Program

The *Natural Resources Management Program* (NRMP) supports a five-year (FY 1990–94), \$125 million policy-based initiative focusing on policy reforms that enhance the ecological sustainability of the harvesting of primary (old-growth) and residual (second-growth) forests. The three major components are performance-based sectoral policy reforms; resource protection through a debt-for-nature swap; and support services for technical assistance, monitoring, and evaluation.

Over the past two years, the effort has helped advance reforms advocated by the program, particularly in the following three areas:

- *A ban on logging in primary forests.* The program has established an active partnership between the government and the private sector. With NRMP's support, local forest protection committees are being organized to monitor forest product harvesting and wood processing. The program is also improving the log monitoring system and is supporting the prosecution of illegal loggers.
- *Increased forest charges.* The program has helped create a mechanism to determine the volume cut and taken from the forest and the corresponding forest charges to be levied. Such a system is currently being deployed to monitor logging activities in three different regions. NRMP has helped increase forest charges from \$1.25 to \$20.00 per cubic meter. Higher charges have led to a 300 percent growth in government revenues from the forestry sector as well as to loggers taking better care of the stands they are harvesting.
- *A community forestry program.* NRMP is financing start-up activities at 20 sites. The program funds local NGOs to assist local communities in organizing low-input, labor-based forest management.

The program concluded a \$5 million debt swap with assistance from World Wildlife Fund and used local currency proceeds to create an endowment fund. To manage this endowment, a new group, the Foundation for the Philippine Environment, was established. The foundation supports resource protection activities undertaken by local NGOs with the interest earned from the endowment fund. Under this component, local NGOs have developed community-based projects to improve the management of high-priority national parks and natural preserves, including such measures as nature tourism and sustainable extraction of forest products.

Concurrently, the NRMP technical assistance component is helping the government develop a planning methodology to facilitate the shift from primary to residual forests as the principal source of timber. The program is establishing prototype forest planning organizations as a vehicle to incorporate active participation of the private sector. This initiative and closely related policy studies will lead to other sectoral reforms—such as

putting resource tenure in local people's hands—that will motivate communities and private businesses to conserve forests out of enlightened self-interest. Local communities have expressed strong support for continuing the government's on-site consultations with community residents. This type of participatory decision making and policy formulation is helping build a consensus on workable and effective procedures for sustainable forest management.

Nationwide aerial surveys are determining the location and extent of the country's remaining primary forests and identifying spots where there are activities that threaten forests. At a high-level workshop in September 1992, participants discussed and completed regional plans for aerial support and recommended including fire management in NRMP activities. In addition, senior officials of the Philippines Department of Environment and Natural Resources were trained on using aircraft as support vehicles for forest surveillance and surveys.

The development of resource management plans is under way on a pilot scale with the assistance of forest service organizations in the private sector. These organizations will help formulate sustainable management plans for residual forests identified for corporate management, community management, or corporate-community partnerships.

5.2.3 Indonesia: Natural Resources Management

The *Natural Resources Management* (NRM) project is an eight-year (FY 1990–97), \$30 million activity to help the Indonesian government address the need for improved analysis and testing of natural resource policies and management practices. The project is designed to strengthen the ability of selected institutions to identify natural resource management constraints on sustainable economic growth and to design and implement improved policies and practices to address these constraints.

A policy working group, organized under the project, conducts research studies and analyses of topics, which include applying natural resource accounting methods to national

income accounting, weighing the costs and benefits of natural forest management versus plantation forestry, and developing strategies to address problems of rapid urbanization. This component also supports extensive training for seven analytical staff and 380 project staff, as well as workshops and seminars to disseminate the project's findings.

A pilot component is strengthening the government's institutional capacity to manage the natural production forests and protected areas. The activities are implemented in partnership with a forest concessionaire, tourism companies, private voluntary organizations (PVOs), and local communities and are helping to generate information essential for formulating improved natural resource management policies. Further, the pilot efforts demonstrate viable management approaches that can be replicated elsewhere, including methods to increase private sector and local community participation. Testing of these innovative approaches and policies is initially planned for implementation in three protected areas of the country. In addition, PVOs are planning awareness-raising campaigns to encourage local communities to participate in the conservation of protected areas.

5.2.4 South Pacific: Wise Use of Marine Resources

The eight-year \$12.8 million *Pacific Islands Marine Resources* (PIMAR) project, launched in 1990, is a follow-on to the *South Pacific Fisheries Development Project*, which ended in FY 1992. PIMAR supports small-scale, sustainable development of marine resources and marine farming activities. Although biodiversity conservation is not a primary objective of the project, it is an essential element of PIMAR's approach that integrates protection and use of a biologically diverse resource. The project is helping to improve fisheries management in the Cook Islands, Fiji, Kiribati, Papua New Guinea, Tonga, and Tuvalu.

These fisheries have been severely depleted over the past few decades by onshore development and increasing fishing pressure. In fact, some species of fish have disappeared throughout the South Pacific. PIMAR will assist governments to better manage and protect

finfish and shellfish stocks, while helping to create employment, increase household incomes, and increase exports. Examples of PIMAR's conservation activities include inventorying and monitoring fish stock levels to establish and maintain sustained yield limits, establishing marine reserves to protect wild stocks, and developing and disseminating improved fishing techniques that minimize collateral catch.

Country-specific project activities follow. Lessons learned from these activities will be spread throughout the region via workshops, short-term technical assistance, training visits, and demonstration programs. The South Pacific Commission Coastal Fisheries Program will execute this regional dissemination component through a \$480,000 grant over a two-year period scheduled to begin in early 1994.

Cook Islands. The outer islands of the Pacific have the potential for farming local marine species. USAID-funded research on black pearl oyster culture was completed under the South Pacific Fisheries Development Project. PIMAR is providing technical assistance to expand the production of black pearls in the Cook Islands for export.

The project has helped establish marine reserves to protect wild stocks of important marine species including the pearl oyster. Sites for these reserves were carefully selected to protect a wide range of both endangered and economically important species. For example, by selecting reserves that have a seaward sandy beach, the project has protected important sea turtle nesting grounds. The reserves are also helping to protect endangered sea birds, such as the curlew that migrates from Alaska to winter in the South Pacific. In addition, the reserves serve as undisturbed control sites against which the effects of commercial operations can be measured.

PIMAR has established a lagoon ecology research station in support of the pearl oyster farming activity. Researchers have established baseline data on the lagoon and are maintaining a close watch to guard against overcultivation and pollution. Assistance also

includes genetic screening of wild stocks of pearl oysters to determine characteristics of different populations. PIMAR has also helped establish prohibitions on transporting oyster stock from one island to another to protect against disease transmission and ensure against loss of genetic diversity.

In March 1992 a preliminary assessment of the ecological characteristics of the first targeted lagoon in the Cook Islands was undertaken; it predicted that the environmental impact of a pilot oyster pearl culture facility would be negligible but recommended that environmental monitoring continue during the course of the project. Although initially local people were concerned about the environmental impact of commercial farming on the lagoon, the Island Council has now given its approval to commercial seeding and pearl farming. Water quality-sensing equipment has been installed and scuba training completed for fishery staff monitoring lagoon ecology. Environmental and economic surveys are also being completed. The Asian Development Bank has loaned the Cook Islands \$4 million for follow-up activities.

Kiribati. The population density of the Tarawa area of Kiribati is among the highest in the world, and improved resource management techniques are needed to increase economic and food security. PIMAR is financing an applied research program to assess marine stocks and the impact of land-based development on the Tarawa ecosystem, which will lead to the formulation of management strategies for marine resources. Activities underway include a three-year finfish and shellfish stock assessment and a two-year monitoring program of lagoon water quality, circulation, and exchange systems. The completion of a house-to-house survey on traditional lagoon management and the preliminary identification of environmental problems have enabled the project to develop an initial list of management options.

PIMAR is conducting an environmental impact study of importance to the future environmental status of the Tarawa lagoon. Several years ago a major international donor funded construction of a causeway cutting the lagoon in two. No allowances were made for exchange of water between the two sides. The populated side is rapidly degrading from sewage effluent and solid waste being dumped into the lagoon. The impact assessment will be used as a basis for justifying opening the causeway with a bridge or culvert to allow water to be exchanged between the two sides. It will also serve as a basis for designing additional mitigation measures to reduce pollution entering the lagoon.

Tonga. The waters of the South Pacific hold the largest stock of tuna in the world. Most of this resource is fished by large-scale foreign fleets; however, new methods of small-scale tuna fishing and expanding air links to new markets present opportunities for Tonga fishermen. To develop these opportunities while ensuring that the entire fishery is properly managed, PIMAR is studying the population dynamics of the baitfish resource in the area. It is assessing the population size, distribution, age, reproductive rates to establish safe harvest limits. The project is also promoting among local fishermen a scaled down version of the long-line technique for tuna fishing which minimizes catch of nontarget species such as dolphin and sea turtles. Another advantage of the long-line approach is that the quality of fish caught is higher than is the case with large industrial fishing ships, thus creating a valuable market niche for the on-shore fishermen.

Tuvalu. Stocks of deep bottomfish, such as grouper and snapper, are available on the outer reef slopes and seamounts (submerged islands often rich in bottomfish) of the Pacific islands. Demand for these table fish is strong and increasing. The fish are relatively easier to catch, handle, and market than tuna (although still beyond the reach of traditional fishing methods and gear), and the supply is steady year-round; yet, these species are slow-growing and prone to overfishing.

PIMAR is providing assistance to Tuvalu to establish the extent of these fisheries and develop safe harvest limits and fishing techniques. Resource conservation activities completed since project start-up in late 1991 include a baseline bottomfish inventory, and training of 20 local fishermen in on-board data collection methods to undertake follow-up monitoring of fish populations.

5.2.5 South Pacific: Profitable Environmental Protection

The *Profitable Environmental Protection* (PEP) project is a five-year (FY 1991–95), \$4 million activity that addresses the need and opportunity to conserve the biodiversity of forest and marine habitats in the South Pacific. The project aims to demonstrate working models of profitable commercial and community enterprises that enable the long-term conservation of biologically and economically vital ecosystems.

This unique enterprise-based project approach to environmental conservation in the South Pacific is in its preliminary stage of implementation on the island-nation of Vanuatu. So far, the project has identified biologically threatened sites where the local communities have expressed a concern and interest in conservation. The Environment Research Institute of California has helped develop a set of tools, including a situation assessment and checklist, to evaluate enterprise proposals. In addition, PEP has begun a survey to identify existing and promising new enterprises that use biological resources in a sustainable fashion. The project is coordinating an extensive survey of both biological resources and potential enterprises and assisting such enterprises in technology, marketing, and financing.

5.3 Country Program: Focus on Nepal

Nepal is a land renowned for its great biodiversity. About 18 million people comprising many ethnic and religious groups live in this Florida-sized Hindu kingdom in the Indian subcontinent. Its rugged topography ranges in elevation from less than 200 feet above sea level along its southern border with India to more than 29,000 feet in the high Himalayan

mountains, which form the country's northern frontier with China and Tibet. The many kinds of habitats found in Nepal's varied terrain support an abundance of wildlife, including more than 100 species of mammals, 850 species of birds, and 5,400 species of plants.

Nepal's rich biological endowment is subject to serious pressures, which threaten its continued productivity. An exploding population, inappropriate public policies, and weak implementing agencies have contributed to a decline in forest cover.

The people of Nepal have traditionally depended on forest commons for fuelwood, fodder for animals, and forest litter for agriculture and other purposes. The forests of the Himalayas also have been an important source of medicinal herbs and spices, both for local consumption and export. In the late 1950s, the government nationalized the country's forests and the harvesting, processing, transport, and trade of forest products. Both the Ministry of Forests and Environment (MOFE) and quasi-governmental organizations such as the Timber Corporation of Nepal carried out forestry activities. In general, these organizations operated under a heavily protected and subsidized environment; hence, official prices did not reflect market value, and the controls over the harvesting and transport of forest products dissuaded farmers from planting trees for other than subsistence requirements. The government's inability to supply more than a small percentage of the country's fuelwood and timber needs resulted in the private sector using extralegal channels to provide these materials. The consequence has been unsustainable exploitation of forest resources, substantial illegal trade with India in raw timber, reduced opportunities for economic contributions through value-added processing of forest products, and marginal incentives for reinvesting profits to sustain forest productivity.

To redress this situation, the Government of Nepal—with the support of several bilateral and multilateral donors, including USAID—recognized the need to reverse its policy of nationalization and to transfer forest management rights back to local communities. The revised forest policy reflects Nepal's 1989 master plan for forestry goals to protect and

sustainably manage the nation's vital forest resources. The primary emphasis of the master plan, strongly supported by USAID, is on community forestry designed to transfer management and resource use rights from the public sector to local user groups.

Using the master plan as an initial guide and in concert with the overall support for Nepal's recent initiative to install a democratic system under a new constitution, the USAID mission in Nepal is pursuing forestry and natural resource management programs that emphasize policy reform, institution building, and private sector participation. In these three areas USAID has a comparative advantage and can fill an important niche to complement the efforts of other international development agencies and bilateral donors working toward the same goals in Nepal. By focusing on strengthening the policy context and institutional capacity for environmental management, USAID is helping to direct and effectively leverage a pool of donor resources much larger than its own.

USAID's strategies and strong field presence in Nepal have enabled it to be a trailblazer in fostering the policy debate on privatization of forests. The mission also supported passage of the 1992 forestry law, which called for revolutionary changes, such as eliminating price controls for fuelwood and timber and cutting permits for harvesting on private lands. By ensuring private and community tenure over forest resources and by encouraging a private-sector-led, demand-driven approach, these strategies can help reduce problems such as smuggling and black marketeering and achieve sustainable management. Moreover, the ongoing policy reform encourages private landowners and communities to conserve resources in the forest areas they are beginning to control.

The projects reviewed below form the foundation of the USAID mission's approach to policy reform and institution strengthening within the sectors of forestry and biodiversity. These efforts will proceed in conjunction with a number of international and local

organizations, including the Government of Nepal, bilateral and multilateral donors, private voluntary organizations, local community groups, and private sector counterparts.

5.3.1 Forestry Development

The *Forestry Development Project* (FDP) seeks to strengthen the government's institutional capacity to implement Nepal's master plan for forestry by promulgating better policies and improving public and private forest management. The project, part of a multidonor effort, aims to facilitate the transfer of forest management rights from the government to local user groups. USAID's financial contribution to FDP amounted to \$6.3 million from FY 1989 to FY 1993, of which \$3 million was a special disposition for the purchase of kerosene during the India-Nepal trade embargo.

The project provides long- and short-term technical assistance to help the Planning Division of MOFE:

- develop an overall strategy for institutional development in the areas of organization, personnel, and technology,
- strengthen planning functions, including streamlining the budget process that releases funds to the field,
- upgrade and expand the analytical capabilities of the ministry,
- update project planning, analysis, and evaluation, and
- install a management information system.

The project has conducted substantial training, including master's-level training for four people in the United States and Asia, short-term formal training overseas, regional study tours, and informal on-the-job training. FDP also has actively promoted legal and institutional reforms to foster a viable private sector in forestry by eliminating disincentives for private tree planting and private processing and transport of forest products. The FDP's involvement in Nepal facilitated the passage of the 1992 forestry law.

FDP's future role will be to support the transfer of management responsibilities for small tracts of community forests from the government to local user groups and to encourage

the government to relinquish control of harvesting, processing, and transport of forest products from the outmoded Timber Corporation of Nepal to user groups and private landowners.

5.3.2 Institute of Forestry Project

This nine-year (FY 1987-95), \$4.6 million effort aims to enhance the capacity of Nepal's Institute of Forestry (IOF) of Tribhuvan University to meet the country's need for trained foresters and natural resource managers in the public and private sector. IOF is the sole institution in Nepal that offers higher education and training in forestry and natural resource management. The project will improve IOF's administration and policies and upgrade its bachelor of science and certificate program curricula, with special attention to community forestry management.

The project is providing short-term training in teaching for IOF faculty and short- and long-term training for selected faculty in a wide range of subjects. It is also strengthening the academic support facilities by providing computers and library publications. Enrollment of women and students from remote areas has increased. Scholarships are being provided to female students because women are Nepal's primary users of forest products and have been underrepresented in the nation's cadre of foresters. In addition, IOF has joined forces with the Japanese government, which is funding the Visiting Scholars Program through the International Timber Trade Organization. This program enables IOF to bring in two visiting scholars every year as a stopgap measure while 15 IOF faculty members, sponsored by the project, are earning master's degrees at U.S. and Asian universities.

5.3.3 PVO Co-Financing II

PVO Co-Financing II is an eleven-year (FY 1987-97), \$16 million project to strengthen the capacity of U.S. and local NGOs to conduct small development projects in concert with government and USAID development efforts in Nepal. Specifically, the project provides

support for subprojects to U.S. PVOs, such as the Save the Children Federation, CARE, the International Union for the Conservation of Nature (IUCN-Nepal), and the Woodlands Mountain Institute. Many of these subprojects are implemented in partnership with local NGOs, such as the King Mahendra Trust for Nature Conservation and the United Mission to Nepal, and encompass natural resource management activities including community forestry and biodiversity conservation. The experiences gained through these activities are an important basis for evolving appropriate forestry practices and policies recommended for adoption on a nationwide scale through FDP. The project also emphasizes engaging PVOs in a national policy dialogue to effect policy changes on the transfer of forests to the private sector.

Further, the Woodlands Mountain Institute is supporting the establishment of a national park and a conservation area to preserve biodiversity and protect pristine forests in the Makalu-Barun (Mount Everest) region, covering parts of both Nepal and Tibet. The approach uses a participatory model of land management that balances the needs of local people with protection of the environment. Tourism development activity and a scientific research program will form important components of this initiative. The relatively small amount of funding provided to the Woodlands Mountain Institute has helped leverage significantly larger funds from other bilateral agencies and the World Bank under the Global Environment Facility.

5.3.4 Rapti Development Project

The aim of the seven-year (FY 1987-93), \$17 million *Rapti Development Project* is to promote public and private sector capacity building to improve both agricultural and forestry production in Nepal's Rapti zone, which includes five districts covering forest areas in the low-lying Terai region adjacent to India. With USAID assistance, government departments have worked with local farmers and farmer groups to increase the supply of agricultural products, including fodder, fuelwood, and timber. The effort seeks to increase household

incomes by promoting local management control of natural resources and use of a more market-led and producer-driven approach.

The Rapti project has played a central role in the multidonor-supported Community Forestry Program by establishing more than 100 local forest-user groups and transferring management rights to 8,000 hectares of accessible forest lands to these user groups. Through a well-designed extension program, these user groups received training, technical advice, and appropriate inputs for developing and implementing forest management plans.

To strengthen the process of transferring forest lands from the government to village communities in the Rapti zone, the project has offered workshops for district and community-level government officials in planning, coordination, and monitoring.

5.3.5 Related Efforts

To improve Nepal's resource management, USAID's Office of the Science Advisor has awarded several research contracts and grants to conduct research studies in biodiversity areas. A prime example is a study on snow leopard predation and habitat. The dissemination of published research results will inform academic researchers, provide models for students, and help set a high standard for future research efforts in the country.

5.3.6 New Program Directions

The *Sustainable Income and Rural Enterprise* (SIRE) program is an umbrella project that was approved in FY 1992. It combines and integrates the resources of four main agriculture and rural development activities in the mission's agriculture and natural resource portfolio: the *Forestry Development Project*, the *Institute of Forestry Project*, the *Rapti Development Project*, and the *Agroenterprise and Technology Systems Project*. SIRE is managing these projects, as well as new activities, to provide financial arrangements that are both more focused and flexible, improving results through greater project integration and impact and

increased program accountability. Through this innovative approach, SIRE also plans to perform new core functions, including a more structured policy dialogue with the government, especially the Ministry of Finance, which complements USAID's other sectoral activities.

SIRE's program outcomes are expected to contribute substantially to increases in private sector sales of cash products, private control and management of farm and forest resources, and implementation of agricultural and forestry policy and regulatory reforms.

Chapter 6

USAID Activities in Latin America and the Caribbean

More than half the world's remaining tropical forests are found in Latin America,⁹³ yet the rate of deforestation in the region—about 1.3 percent a year and growing—is the highest in the developing world.⁹⁴ Forests continue to disappear and current reforestation efforts are not offsetting the losses. Trees are being cut ten times faster than they can be replaced. Land speculation and the pressure to clear land for agriculture contribute to deforestation in the region along with government economic and forest management policies. Under the current pattern of extensive agriculture and cattle raising, widespread forest conversion will continue, threatening the region's social stability and ecological and economic productivity.⁹⁵

The loss of forest habitat threatens the rich flora and fauna of the region. Some of the world's most biologically diverse countries—Bolivia, Brazil, Colombia, Mexico, and Peru—are found in Latin America. The region contains about 40 percent of the plant and animal species of the world's tropical forests.⁹⁶ Crops that originated in Latin America currently account for about one-third of the world's food production. Many of the wild species related to the world's major food crops—including cassava, corn, tomato, potato, plantains, and cacao—come from Latin America. A cornucopia of products, including rubber, oil, cosmetics, herbal medicines, and spices, are derived from new world plants and animals. A wealth of biodiversity is also found in the region's coral reefs, mangroves, and wetlands, which provide unique habitats for migratory species and nurseries for fish and crustaceans.⁹⁷

Bureau strategy for biodiversity and tropical forest conservation. USAID's Latin America and the Caribbean (LAC) Bureau addresses these issues through a broad environment strategy that attacks root causes such as poverty, rapid population growth, policy and market failures, and weak institutions. Dealing with the threats to tropical forests

and biodiversity is one of the highest priorities in the Bureau's strategy. To complement the strategy and to assist USAID missions and developing countries in responding to environmental challenges and opportunities, the Bureau also published the report *Green Guidance for Latin America and the Caribbean* in 1993.⁹⁸ Both the strategy and report emphasize several activities:

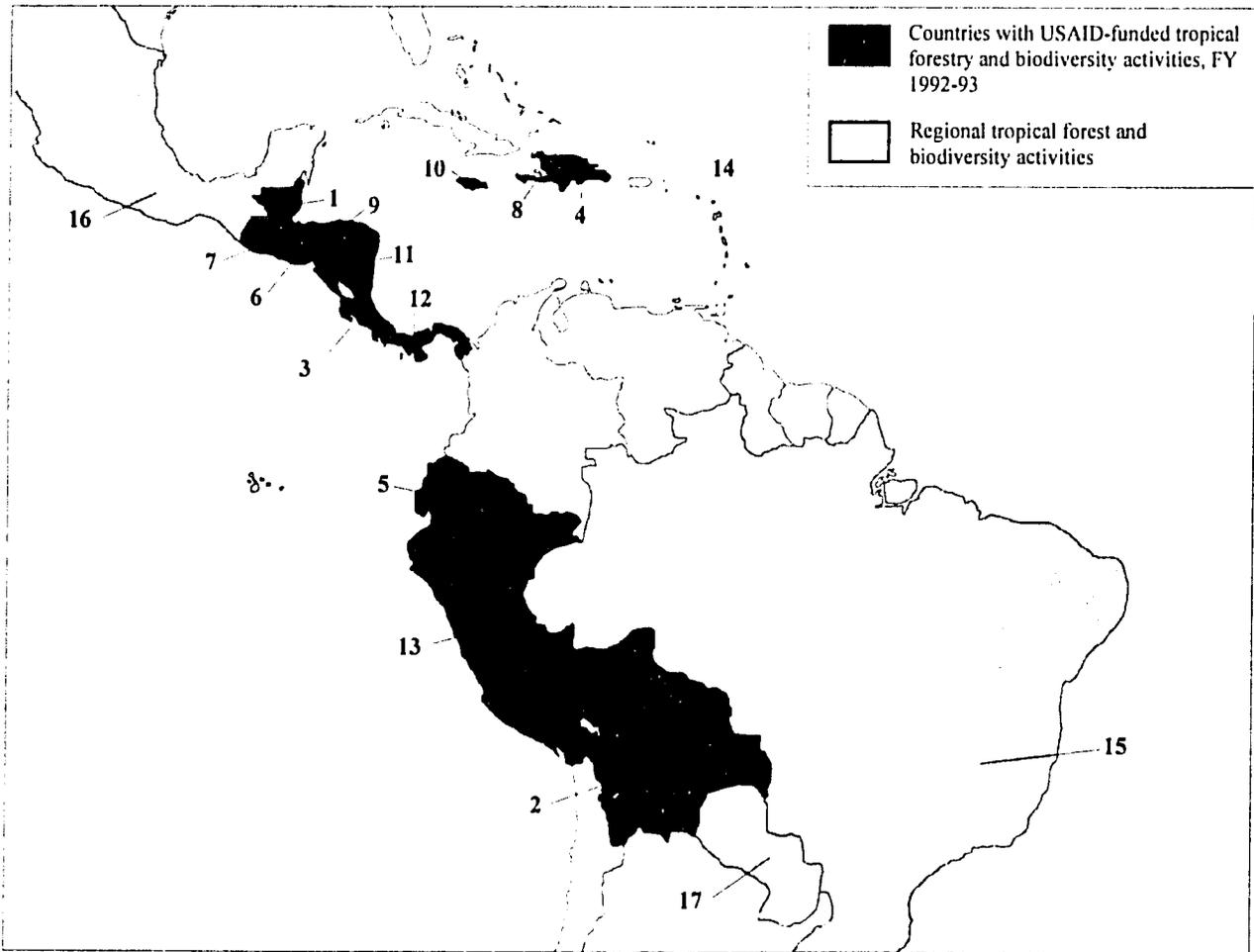
- Reforming policies, restructuring economic incentives, and strengthening institutions to improve management and sustainable use of forests. Policies on resource tenure, timber and wood markets, and international trade in forest products are particularly important.
- Supporting and strengthening the capability of institutions—including government agencies and nongovernmental organizations (NGOs)—to conduct the planning, implementation, and evaluation needed to manage natural resources sustainably.
- Promoting institution building, environmental education, research, and environmental monitoring to support biodiversity conservation, especially in critical wildlands, parks, and protected areas.

Funding trends. The distribution and funding levels of the Latin America and the Caribbean Bureau's tropical forest and biodiversity conservation program is shown in figure 6.1. LAC was the only bureau to show an increase in FY 1993 from its FY 1991 level. This is largely due to parallel funding for the Global Environment Facility received late in FY 1993. The sharp (\$23 million) decline in FY 1992 was widespread across the region. Biodiversity conservation has grown in importance in the region with several projects supporting protected area management.

6.1 New Activities

To carry forward its work on tropical forest and biodiversity conservation in the region, USAID developed several new projects during FY 1991–93. These include efforts in Belize, Bolivia, Brazil, El Salvador, Honduras, Mexico, Nicaragua, Peru, and the Caribbean.

Figure 6.1: Bureau for Latin America and the Caribbean, FY 1992-93 Tropical Forest and Biodiversity Conservation Obligations

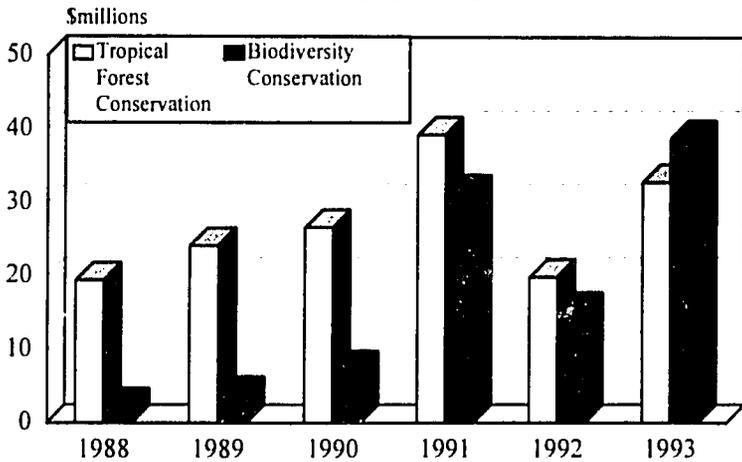


FOR USAID INTERNAL USE ONLY

Geographic Distribution (\$000s)

	1992	1993
1 Belize	1207	908
2 Bolivia	141	2002
3 Costa Rica	500	700
4 Dominican Republic	228	156
5 Ecuador	1498	1456
6 El Salvador	200	2560
7 Guatemala	1943	1365
8 Haiti	5745	2644
9 Honduras	518	4485
10 Jamaica	1300	1893
11 Nicaragua	0	832
12 Panama	3000	2000
13 Peru	244	550
-- Regional Projects		
14 Caribbean	2614	1629
ROCAP	2111	1953
LAC Regional	9717	31552
15 Brazil	--	--
16 Mexico	--	--
17 Paraguay	--	--
Total	30,966	56,685

**Bureau Totals
Fiscal Years 1988-93**



6.1.1 Bolivia: Promoting Sustainable Forest Use

Helping reduce forest, soil, and water degradation as well as promoting environmentally sound and sustainable forest use are the aims of the seven-year, \$20 million *Sustainable Forestry Management* project, initiated in FY 1993.

Deforestation is a major environmental concern in Bolivia. Each year, as many as 200,000 hectares of forest are destroyed by farming, logging, and oil exploration. To address the problem, the project is establishing pilot natural forest management programs in two sites. The project emphasizes forest production and protection, as well as ways to provide positive incentives for sustainable forest use. The project is coordinating its activities with a small-grant fund established under the Enterprises for the Americas Initiative (EAI) (see box 6.1).

6.1.2 El Salvador: Preserving Mangrove Ecosystems

The four-year, \$20 million Salvadoran *Environment and Natural Resources Protection* (PROMESA) project was initiated in FY 1993 to preserve the mangrove ecosystems of El Salvador by integrating watershed protection and coastal zone management. The project is supporting improved natural resource management in four 80,000-hectare demonstration sites on the coast, potentially including the watersheds leading into the Gulf of Fonseca. Pollution and siltation entering this gulf affect major fisheries in El Salvador, Honduras, and Nicaragua. The effort will also strengthen environmental NGOs and promote environmental education.

6.1.3 El Salvador and Honduras: Environmental Protection Funds

USAID is helping to organize national environmental protection funds for El Salvador and Honduras. In Honduras, for example, the five-year *National Environmental Protection Fund Project* is helping NGOs work more effectively in such areas as park and reserve management, education, reforestation, watershed protection, and environmental information.

Box 6.1

The Enterprise for the Americas Initiative

In June 1990 the United States launched the Enterprise for the Americas Initiative (EAI). Among its goals is reducing the debt burden on Latin American and Caribbean nations. The region's bilateral debt to the United States, including concessional and nonconcessional debt, totals \$12 billion. As of June 1993 the EAI had reduced \$875 million in concessional debt owed by seven eligible countries. In FY 1993 Congress appropriated \$90 million for EAI debt reduction. The Clinton Administration plans to continue the EAI and has requested \$71 million from Congress for EAI debt reduction in FY 1994.

The initiative links debt reduction with programs that promote environmental protection and the survival and development of children. Nations that qualify for debt reduction have the additional benefit of paying interest on the remaining debt in local currency under a bilateral agreement called an Americas Framework Agreement. Local currency interest payments are channeled through a trust fund to grass-roots projects that benefit the environment and children.

The U.S. Enterprise for the Americas Board provides general oversight for the environmental components of the EAI. The board is chaired by the U.S. Department of the Treasury; the U.S. Department of State serves as vice-chair and the U.S. Environmental Protection Agency as board secretary. USAID, the Inter-American Foundation, the U.S. Department of Agriculture, and five U.S. nongovernmental organizations (NGOs) also serve on the board.

As of August 1993, the United States has concluded debt reduction agreements with Argentina, Bolivia, Chile, Colombia, Jamaica, and Uruguay, with the potential to generate as much as \$154 million for trust fund projects. Framework agreements are now in place for these same countries, as well as El Salvador.

The distribution of funds among environmental and child survival-related activities depends on the origin of the loaned funds. In-kind loans of PL 480 food commodities can generate funds only for environmental efforts. Bolivia, therefore, which has only a PL 480 account, will devote the funds generated under its debt reduction agreement exclusively to environmental projects. USAID development assistance loans, however, may generate funds for three types of activities: (1) environmental activities; (2) child survival activities with positive environmental impacts (for example, environmental education, cleanup of drinking water supplies, and disposal of lead paint inside buildings); and (3) activities that produce benefits only for child survival and development. In general, most activities promoted under debt reduction agreements fall under the first two categories and promote environmental protection to some degree.

Under the Enterprise for the Americas Framework Agreement, the debtor nation sets up a locally managed administering body or commission to determine which environmental issues to address and which projects to fund. The commission must include a majority of representatives from local NGOs, nominated by the government in broad consultation with the public. Different agencies and organizations may serve as secretariat for the commission. In several nations an existing natural resource government agency or quasi-governmental organization, such as the National Fund for the Environment in Bolivia, serves as secretariat. In others, such as Jamaica, a new foundation is created to administer the grants.

Most of the nations that have signed debt reduction agreements are still in the process of developing the mechanisms needed to select and fund conservation projects. Bolivia has made the most progress: its administering commission recently funded 29 projects (of the 275 proposals received) at a cost of \$1.8 million. Seven projects have already been launched; they cover watershed management, reforestation, sustainable agriculture, protected area establishment and management, water pollution, and institution building, among other topics. Over the next 14 years, a total of \$21.8 million dollars will be devoted to environmental projects in Bolivia.

6.1.4 Peru: Improving Natural Resource Management

The three-year, \$3.6 million *Employment and Natural Resource Sustainability* project in Peru began in late FY 1991. The project is helping to conserve biodiversity and increase rural income through sustainable use of biological resources in and near the Pacaya-Samiria National Reserve in central Peru. The Nature Conservancy (TNC) and the Peruvian Foundation for the Conservation of Nature are matching support from the USAID grant to raise the project's three-year budget to more than \$5 million.

Studies to identify special resource management needs and opportunities for sustained economic development are planned. Small-scale activities are being undertaken to increase opportunities in such areas as nontimber forest products and agroforestry.

6.1.5 The Caribbean: Advancing Environment and Coastal Resource Management

The eight-year (FY 1991–98), \$13 million Caribbean *Environment and Coastal Resources* (ENCORE) project seeks to promote partnerships among public, private, and community organizations to conserve the region's natural resource base. The eight island-nations that belong to the Organization of Eastern Caribbean States (Antigua and Barbuda, the British Virgin Islands, Dominica, Grenada, Montserrat, St. Kitts-Nevis, St. Lucia, and St. Vincent and the Grenadines) are characterized by high levels of marine and terrestrial biodiversity and many unique land-based species. Deforestation and land clearing for agriculture over centuries have placed intense pressure on Caribbean habitats. Endemic species on many of the islands are now threatened or endangered. Urban development, largely along coastal areas, has led to increasing stresses on these fragile ecosystems, degrading coastal areas and wildlife habitats, changing hydrologic regimes, and causing soil loss and water and air pollution.

ENCORE addresses the islands' environmental problems through two components:

- *Regional environmental management*, including environmental monitoring, training, policy dialogue, and environmental public awareness and education.
- *Local site management*, including empowerment of communities in St. Lucia and Dominica to implement programs in biodiversity conservation and sound natural resource management. Local communities participate in all stages of project development and implementation, thereby demonstrating the advantages of community and governmental partnerships in managing natural resources for long-term sustainable economic growth.

Activities carried out during FY 1992–93 under the regional environmental management component of ENCORE included preparations for a multimedia campaign on proper solid waste disposal and safe use of agrochemicals; development of a training plan for

the project; completion of guidelines on environmental assessments for the Caribbean for use by national and local project management teams; an inventory of land-based point sources of marine pollution; and training activities in environmental policy, environmental management, and agriculture and sustainable development. ENCORE is also assisting officials in Dominica's Ministry of Agriculture and Economic Development Unit in the design of a National Environmental Action Plan. Technical assistance for the regional component of ENCORE is being provided by World Wildlife Fund through a cooperative agreement with USAID.

Under the local site management component, ENCORE promotes biodiversity conservation in Soufrière, St. Lucia. Soufrière has been identified as a potential United Nations World Heritage Site and a priority site by the St. Lucia Systems Plan for Parks and Protected Areas and the National Physical Development Strategy for St. Lucia. Through ENCORE an agricultural and watershed management project has been initiated to encourage small-scale, sustainable, community-based agriculture enterprises. An additional project supporting conservation of marine biodiversity and fisheries management helps maintain stocks for local reef fishermen. Preparations to develop a city park in the midst of a dense settlement in Soufrière (to be managed by the local Lions' Club) are under way. ENCORE has also funded a series of conflict resolution workshops in Soufrière to support moves to declare part of the coastal area a marine reserve. Groups involved have included fishermen, divers, yachtsmen, restaurateurs, hoteliers, public sector officials, and NGOs.

In Portsmouth/Cabrits and Scotts Head, Dominica, local site management activities are helping to conserve marine biodiversity by strengthening reserves in key marine areas and by instituting marine-use zoning. Park sites in Cabrits have already been identified. Monitoring stations for collecting data on beach profiles and wave action are being set up in three areas in a collaborative effort between the forestry director and community groups. To

foster greater awareness among local residents of the value of their marine resources, scuba diving is being taught to schoolchildren.

Representatives from each country will participate in regional workshops to assess systematically the local site experiments and to examine ways to encourage replication of successful activities.

6.1.6 Belize: Natural Resource Management and Protection

In FY 1991, to enhance natural resource management efforts in Belize, USAID launched the five-year, \$8.5 million *Natural Resource Management and Protection* project. The project includes a \$1.5 million component that supports forest management. Rapid assessments of critical and threatened areas, supported by remote imagery, are helping stem tropical deforestation. The project is helping the Government of Belize establish firm boundaries for forest reserves, protected areas, and production forests.

The project is also strengthening the government's ability to monitor key indicators of environmental quality, assess environmental impacts of development projects, and enforce compliance with the terms of forest harvest concessions.

6.1.7 Panama: Natural Resource Management

In Panama the five-year (FY 1991-95), \$15 million USAID *Natural Resources Management* (MARENA) project is working to strengthen the capability of Panama's National Institute of Renewable Natural Resources (INRENARE) and conservation NGOs to protect and manage Panama's renewable natural resources, with particular emphasis on the Panama Canal Watershed. The MARENA project focuses on assistance to improve management of 14 parks and reserves in Panama, beginning with the Panama Canal watershed area and extending to other national parks and wildlands.

The project has three major components:

- Strengthening INRENARE's capabilities in areas including environmental impact assessment and land use classification. The project also provides support for the NATURA foundation and other NGOs and local community groups in environmental activities.
- Assisting INRENARE in establishing new national parks and reserves and improving management and protection of these areas. Efforts under this component include: boundary demarcation, development of park management plans, park staff training and support, inventories of natural resources and land use practices in the parks and reserves, and assistance to INRENARE in developing a National Parks and Equivalent Reserves Law.
- Utilizing a debt-for-nature swap to endow the NATURA Foundation with a long-term funding source to finance environmental activities of both public and private organizations. Proceeds from the swap are deposited in a Conservation Trust Fund to be implemented by NATURA.

By January 1994 USAID will be providing \$8 million for a radio network, land and water transportation vehicles, and training to build the institutional capacity of INRENARE. A baseline and forest change map of Panama from satellite imagery was also planned to illustrate changes from the mid-1980s to 1992.

6.1.8 Nicaragua: Natural Resource Management

USAID also launched the six-year (FY 1991-96), \$9 million *Natural Resources Management* project in FY 1991 to help protect biodiversity in three high-priority sites in Nicaragua: the Miskito Coast Protected Area on the North Atlantic Coast, the Bosawás Reserve in the Central Highlands, and the Chococente Wildlife Refuge, a nesting area for two species of endangered sea turtles on the Pacific Ocean.

The project is helping to strengthen the Nicaragua Institute for Natural Resources and Environment (IRENA). The country's primary agency for natural resource scientific investigation, policy formulation, regulation, and oversight, the institution was essentially dismantled under the former Sandinista government. The project is strengthening IRENA's capacity to conduct natural resource policy analyses and help the institute expand its current focus on forest and land use planning to include overall environmental quality regulation. Establishment of a Conservation Information Center within IRENA was planned to provide data on resources in Nicaragua's tropical forests and wildlands.

The Caribbean Conservation Corporation (CCC) has undertaken preliminary studies to design and manage the Miskito Coast Biological Reserve, a 5,000-square-mile marine and coastal area containing some of Central America's least disturbed and most important coastal wetlands and lagoons. Still largely untouched by coastal development, this area is a biological treasure occupied by diverse biotic communities, including the West Indian manatee and the South American dolphin.

Nicaragua's Miskito Coast is also home to the largest resident population of green turtles in the western Atlantic, yet preliminary data suggest that a large and possibly unsustainable harvest of marine turtles is being extracted from the area. A two-week training program was conducted to enable coastal communities to better understand techniques for monitoring turtle harvests.

An informational tour of the Florida Keys National Marine Sanctuary was conducted in October 1992 to provide Miskito Indians and Nicaraguan government representatives with a firsthand opportunity to see how valuable and threatened coastal resources are managed in the United States.

Seminars on resource conservation were conducted for representatives of all 23 communities within the Miskito Coast Protected Area in FY 1992. CCC helped Miskito tribespeople create the nongovernmental organization MIKUPIA to promote the protected area within local communities.

In the protected area, the project supports biological inventories, assessments of coral reefs and sea grasses, mapping of protected areas, and censuses of the multitude of water birds that breed in the area.

6.1.9 Addressing Global Climate Change through Forest Conservation

The *Environment and Global Climate Change* (E/GCC) program is a five-year, \$2.8 million effort managed by USAID to address factors that contribute to global climate change in countries that produce large amounts of greenhouse gases, especially carbon dioxide. Brazil and Mexico are the two primary countries targeted by the program; their country-specific projects under E/GCC will receive most of the program's funding. The countries of Central America were also selected, in part because the region provides an opportunity to develop a model of international cooperation to tackle environmental and natural resource management problems.

Because the primary source of greenhouse gases in the region stems from the destruction of tropical forests, the E/GCC focuses on the sustainable use of forest resources. The program is developing pilot demonstration activities, promoting policy reform, and strengthening the capabilities of local institutions to implement effective policies and disseminate technologies.

Environmental law and policy related to climate change is one focus of the project. For example, the U.S.-based Environmental Law Institute (ELI) received a \$165,000 grant to identify and analyze governmental policies and legal and institutional structures that

encourage destruction of Mexico's tropical and temperate forests. The effort is helping to develop strategies for reforming these policies, laws, and institutions to redirect incentives to promoting sustainable forest management. A series of research, training, and information exchange projects are being conducted in cooperation with public and private sector partners.

As a case study on policy, legal, and institutional structures that affect forest resources, ELI and its Mexican partners will focus on two protected areas: the Lacandon reserve in the southern state of Chiapas and an ecological reserve for the protection of the monarch butterfly in the state of Michoacán. To improve environmental planning and management in Mexico, the Fundación Mexicana para la Educación Ambiental received a \$134,000 grant to provide technical assistance and training to the local managers of these reserves.

E/GCC is also supporting research and pilot demonstration activities for new nontimber products and for improving the cultivation and processing of traditional ones, such as Brazil nuts and rubber.

In addition, E/GCC is providing support to establish and manage protected areas such as extractive reserves and national parks. An example is the effort to consolidate and manage protected areas and their buffer zones in southern Mexico. The current focus is on eight reserves that together contain more than ten million acres of tropical forest: Calakmul, Sian Ka'an, El Ocote, El Triunfo, Ría Celestún, Río Lagartos, Montes Azules, and the Chimalapas.

To implement the Mexico Tropical Forestry Action Plan and its activities in and around priority protected areas in southeastern Mexico, E/GCC provided a \$200,000 grant to Mexico's Fundación Miguel Aleman in FY 1992. To promote sound management of the Calakmul Biosphere Reserve and its surrounding buffer zone to reduce forest loss and

degradation, the Mexican environmental organization PRONATURA received a \$75,000 grant in FY 1992.

In Brazil, World Wildlife Fund (WWF) has developed a comprehensive program to reduce the rate of tropical deforestation. The program focuses on environmental impact assessments, natural resource economics, institution strengthening, timber management, and management of protected areas. A component on environmental education was planned. A preliminary action plan for work in Jau National Park was completed in FY 1992 in preparation for the development of an overall management plan.

WWF is supporting efforts to develop extractive reserves of natural forest products along the Cajari and Maracá Rivers in Amapá to provide an environmentally sound development alternative to timber harvesting and land clearing. Community associations are already involved in processing and marketing Brazil nuts. Small processing centers will be established at Marinko and Santa Clara.

E/GCC is also targeting timber management. As part of a plan that will be used by a local private sawmill in Paragominas, Brazil, an inventory has been completed of a 200-hectare pilot area. One effort in particular aims to demonstrate that forestry activities, if properly planned, can be sustainable economically and ecologically. One hundred hectares are being managed according to a model management plan and then compared with another 100 hectares managed by a logging company using traditional harvesting methods.

To help local NGOs working on conservation programs better achieve their organizational goals, the project supported a strategic planning workshop in Amazonia in May 1992. The project also prepared several self-help guides for NGOs, including Portuguese versions of the *Guide to Designing Effective Proposals* and a corresponding training workbook.

6.2 Ongoing Projects

Several more mature USAID projects already underway in Latin America and the Caribbean range from regionwide forestry activities in Central America under the *Regional Environmental and Natural Resources Management* project to highly focused activities, such as the *Forest Conservation and Management Project* (BOSCOSA) in Costa Rica's Osa Peninsula and the *Maya Biosphere Natural Resource Management Project* in Guatemala.

6.2.1 Central America: Regional Environmental and Natural Resources Management

The seven-year, \$48.5 million *Regional Environmental and Natural Resources Management* (RENARM) project is a broad-based effort begun in FY 1989 to conserve and manage the productive potential of Central America's natural resources. Resolving Central America's environmental and natural resource problems requires a long-term, multifaceted approach. The RENARM project is helping to solve these problems by integrating environmental and developmental efforts on a regional scale and establishing the basis for ensuring environmental quality and sustainable yields of natural resources. RENARM is committed to the economic growth of Central America through natural resource management and continues to expand this focus to ensure that environmental concerns are integrated into all USAID development activities.

USAID designed RENARM to address the prospect that, given expanding populations and the rapid depletion of natural resources in Central America, future generations of Central Americans could suffer from a reduced resource base and damaged environment. Four constraints to sustainable development in the region were identified in a key USAID report, *Environment and Natural Resource Management in Central America: A Strategy for A.I.D. Assistance*:⁹⁹ (1) economic policies, regulations, and legal systems that stimulate economic growth at the expense of environmental protection; (2) institutional weaknesses that contribute to ineffective management of renewable natural resources; (3) cultural and social

forces, such as population growth, that have weakened traditional agrarian systems; and (4) lack of knowledge and tools to reduce the impact of human exploitation of the environment.

Central America's challenge, according to the report, was to break out of the cycle of crisis and "forge a stable sociopolitical consensus conducive to long-term sustainable economic development." Specifically, USAID assistance would be geared to "produce, with the citizens of Central American countries, the conditions for sustained management of natural resources in a manner that minimizes the damage to the environment, protects biodiversity, and provides the means for equitable and sustainable economic growth."

In a series of ecologically diverse zones stretching from Guatemala to Panama, RENARM is establishing regionwide environmental agreements and collaborative efforts among governments and other regional agencies. The project is implemented through more than three dozen contracts and agreements with nongovernmental organizations (NGOs), academic institutions, U.S. government agencies, and private consultants (see table 6.1). It brings together major actors with ongoing interests, experience, and programs in environmental and natural resource management in Central America.

RENARM supports three technical components: (1) natural resource policy initiatives directed at public and private leaders, (2) environmental awareness, education, and biodiversity conservation aimed at the population as a whole, and (3) sustainable agriculture and forestry practices supporting watershed management, forestry, and plant protection, including the reduction and rational use of pesticides. Because all RENARM implementors are engaged in environmental policy dialogue and reform, no project component is independent of the others.

An ongoing effort to monitor and evaluate the impact of the project's activities has identified significant achievements during FY 1992-93,¹⁰⁰ described below by priority area.

Table 6.1: Major RENARM Activities

Implementor	Activities	Funding (\$000)
Center for Tropical Agricultural Research and Education (CATIE) (3 grants)	Watershed management, tree crops, natural forest production, plant protection, sustainable agriculture symposium, institution strengthening, tropical forestry action plan	21,600
CARE, The Nature Conservancy (grant)	Regional environmental strategic planning, monitoring, and information dissemination; environmental education; wildlands management	5,500
Pan American Agricultural School (EAP) (3 grants)	Development and dissemination of sustainable integrative pest management (IPM) technologies, development of IPM course, institution strengthening	3,600
USDA/Office of International Cooperation and Development (OICD) (PASA)	Short-term technical assistance and training from APHIS, OICD, USFS, EPA, FDA, and Peace Corps in pesticide management	2,000
Management Systems International (contract)	Monitoring and evaluation of RENARM activities	1,700
Wildlife Conservation International (grant)	Regional wildlands management	1,600
Cultural Survival (grant)	Institution strengthening among jungle-dwelling indigenous groups	1,145
U.S. Environmental Protection Agency (PASA)	Pesticide management, EPA and FDA technical assistance, training and support	1,075
Interamerica Management and Consulting Corporation	Wood utilization and market development	900
Abt Associates (3 contracts)	Natural resource policy inventory, synthesis of lessons learned from policy inventories, policy taxonomy, and analytical framework	500
World Resources Institute (2 contracts)	Technical support to CCAD, strengthening of national environmental commissions through CCAD (pending)	490
Nutritional Institute of Central America and Panama (INCAP) (2 grants)	Pesticide management, training of medical personnel in recognition and treatment of pesticide intoxication	470
Central American Commission on Environment and Development (CCAD) (grant)	Support to CCAD operational activities, provision of technical assistance and training	190
The Nature Conservancy (grant)	Fellowship for Central American conservation professionals	190

Box 6.2

Policies That Destroy Forests

Deforestation in Latin America and the Caribbean is taking place, among other reasons, because sustained forest management cannot compete economically with other land uses under current government policies that undervalue forest products and ecological services.

USAID's *Agriculture and Rural Development Technical Services* (LAC TECH) project, a ten-year, \$20 million effort begun in FY 1989, augments the capacity of the Bureau for Latin America and the Caribbean to provide technical assistance to field missions in selected agricultural and natural resource management areas through its Rural Development Division. During FY 1992-93, LAC TECH completed a comparative analysis of tropical deforestation in Costa Rica, Bolivia, and Ecuador. The case studies identified and quantified forestry, agricultural, and other government policies that perpetuate deforestation. The studies also identified policy reform processes with the best chance of succeeding, given the various stakeholders.

As these case studies demonstrated, trade policies designed to protect fledgling domestic forest industries are costly because they discourage sustained-yield management. Tariff barriers exclude timber imports, eliminating the supply of cost-effective substitutes, leaving local industries with little incentive to produce efficiently. Legislated trade restrictions, including log export bans, prevent domestic products from competing on more lucrative international markets. Together, these distortions seriously reduce the value of trees as timber whether the forests are primarily publicly owned, as in Bolivia, or privately held, as in Costa Rica.

Although the impact varies in each country reviewed, distortions consistently lead to industry inefficiency and excessive waste. In all three countries, product prices fail to reflect the costs of replacement, encouraging depletion of forest resources. As a result, investments are declining in forest management, plantation establishment, research and development, and regulatory capability. Ultimately, the undervaluation of forests discourages sustainable management and encourages conversion of forests to other land uses, such as ranching and slash-and-burn agriculture, which offer short-term profits at great environmental cost.

The case studies recommended policy reform options to encourage sustainable management by timber companies, indigenous groups, colonists, and governments. Those options include:

- liberalizing trade in forest products and dismantling regulations that inhibit forests from competing with other land uses,
- developing and maintaining systems that track and mitigate the environmental and socioeconomic impacts of forest use,

- redirecting investment to forestry research and to strengthening of national forest services,
- addressing tenure insecurity and restructuring agrarian reform laws so that forest management legitimizes claims, and
- creating options for long-term financing for forest development and conservation.

The case studies were reviewed by economists, resource managers, and policy analysts from government, industry, and local and international nongovernmental organizations (NGOs) and have stimulated policy reform dialogue within governments and between governments and donors. At a workshop planned for FY 1994, Latin American and Caribbean policymakers and representatives of development agencies, multilateral banks, and international NGOs will have the opportunity to build a consensus on policy reform options and processes and on the investments, incentives, and legislation needed to effect them.

Biodiversity protection and wildland management. Two consortia of NGOs are promoting the conservation of biodiversity in national parks, reserves, and other wildlands through RENARM: the Environmental Project for Central America (PACA) and Paseo Pantera (Path of the Panther).

PACA is a joint effort by CARE and The Nature Conservancy that encourages protection of midlands by helping communities bordering protected areas to derive sustainable benefits from them. Local residents participate in reforestation efforts, tree nursery management (including three multipurpose tree nurseries and a woman-managed tree nursery designed to produce 150,000 trees), breeding wildlife in captivity; and fire prevention. Through the PACA consortium, 12 schools and over 1,000 students are participating in ecology and wildlife management programs. PACA has also published a *Rapid Ecological Assessment Manual*¹⁰¹ for use by NGOs in Central America and, in collaboration with the Central American Commission on Environment and Development (CCAD), sponsored the first trinational meeting on a protected area strategy for the Maya forest region for Belize, Guatemala, and Mexico.

Paseo Pantera is a shared effort of the New York Zoological Society, the Wildlife Conservation Society (formerly Wildlife Conservation International), and the Caribbean Conservation Corporation to improve management plans and designs of reserves to optimize the preservation of wildlife throughout Central America by creating a biological land corridor linking reserves throughout the Central American isthmus. In Honduras, Costa Rica, and Guatemala, Paseo Pantera has helped establish national ecotourism councils to minimize environmental damage and coordinate efforts on ecotourism in the region. Paseo Pantera also sponsors regional workshops on ecotourism, ecology, wildlife uses, and buffer zone management.

Sustainable forestry and agriculture. RENARM is working with a number of institutions to implement a wide assortment of activities in watershed and natural forest management, and tree crop dissemination. These include:

- *Watershed management.* The Center for Tropical Agricultural Research and Education (CATIE) completed the widening and deepening of the silted Purires River in Costa Rica, controlling floods and diminishing economic and social costs. Together with its collaborating institutions, CATIE promotes on-farm conservation practices and offers courses on soil conservation, sustainable agriculture, and geographic information systems.
- *Farm forestry.* Working through a network of 25 extension organizations at dozens of locations in the region, CATIE is supporting the planting, management, and use of multipurpose trees on small- and medium-sized farms. Dissemination of information and technology has convinced thousands of farmers to plant trees, resulting in expanded reforestation; increased local sources of fuelwood, poles, fence posts, and lumber; and with increased employment, income, and land values.
- *Production from natural forests.* By working with cooperatives, private landowners, NGOs, and others, CATIE is demonstrating the feasibility of sustainably managing lowland rain forest on a commercial scale through forest inventories, management plans, harvesting techniques, and silvicultural improvements. Seventeen pilot work areas in four

countries are applying sustainable natural forest management techniques.

Human resource development. CATIE and the Pan American Agricultural School (EAP) have expanded master's degree programs and have graduated over 100 students in watershed management, natural forest management, tree crop management, and IPM. RENARM has supported short-term training activities for thousands of students, including workshops in environmental education, buffer zone management, sustainable agriculture, and forestry. Other RENARM-supported education activities include national campaigns against forest fires, multimedia environmental education campaigns, biological control of agricultural pests, integrated pest management degree programs, and mass-media efforts and poster campaigns supporting safe pesticide use.

Organization strengthening and technical assistance. The technical assistance supplied by RENARM has proved cost-effective because of its accessibility and ability to transfer experience, technologies, and research among Central American countries, USAID projects, NGOs, and other donor agencies. Through RENARM, CATIE and EAP have expanded and upgraded their natural resource management education programs by hiring additional professors and building laboratories. RENARM financial support enabled CCAD to convene several international forums and orchestrate agreements such as the regional biodiversity treaty signed by Central American presidents in 1993. RENARM's work with indigenous NGOs includes technical assistance and financing to create the institutional capacity for proper management of protected areas.

Policy initiatives. RENARM promotes environmental policies that encourage sound management of forests, soils, coasts, and biodiversity. To this end, RENARM has funded inventories of policies that affect natural resources and the environment, focusing on forestry issues in Belize, Costa Rica, El Salvador, Guatemala, and Honduras. This work resulted in

publication in 1992 of *The Green Book: An Environmental Policy Sourcebook*,¹⁰² which will facilitate understanding of policy issues and alternatives for NGOs, donor agencies, and Central American policymakers. RENARM has also provided technical support to the Central American Regional Interparliamentary Commission on Environment and Development (CICAD) and helped organize the new Women's Environmental and Development Program of the Central American First Ladies.

6.2.2 Guatemala: The Maya Biosphere Natural Resource Management Project

This effort aims to improve management of the Maya Biosphere Reserve, located in the Petén-Caribbean lowland region. The Petén, a 14,000-square-mile sweep of tropical forest and savanna covering the northern third of Guatemala, is one of the largest expanses of forest left in Central America. In 1990 Guatemala set aside 40 percent of the Petén as the Maya Biosphere Reserve. At 1.5 million hectares—four times the size of Delaware—the reserve is exceptionally rich in biodiversity, including jaguars, tapirs, monkeys, and more than half of Guatemala's 664 species of birds. Located within a larger bioregion that includes parts of Mexico as well as Belize, the reserve also contains numerous archeological sites, including the world-famous Mayan ruin Tikal, which alone attracts 15 percent of all tourists who come to Guatemala.

The Petén is under extreme human pressure. At current rates of destruction primary forests will disappear within the next 30 years. In the last 20 years, the population has soared and development has spread rapidly.

USAID's \$10.5 million *Maya Biosphere Natural Resource Management Project*, initiated in FY 1990, provides financial and technical assistance to the National Council for Protected Areas (CONAP) to manage the reserve's resources more sustainably. Important components of the project include applied research, extension and training, development of markets for sustainably harvested forest products, and promotion of low-impact tourism. A

key focus is implementation of policy changes that will allow local communities and forest harvesters to receive greater benefits from the diverse wildland resources of the reserve as well as conserving these same resources over the long term.

Three U.S. private voluntary organizations are implementing the project. The Nature Conservancy is working on activities related to institution strengthening and biosphere administration; CARE is closely involved in community extension and education services related to natural resource management; and the Rodale Institute is assisting with development of an agroforestry research and extension center for the buffer zone and areas south of the reserve. Conservation International (CI) is undertaking the project's sustainable resource management component. Funds provided by USAID/Guatemala will help generate income for ProPetén, CI's program to bolster the renewable forest product economy of local communities that rely on the extractive reserves of the Maya Biosphere Reserve.

Under the project, the first major conservation debt swap in Guatemala was completed in May 1992. The swap of up to \$5 million is generating a continuous flow of Guatemalan currency, which is being used to create a permanent endowment for conservation-based activities in Guatemala's Petén region, helping to ensure the long-term sustainability of the Petén's promising forest product economy.

Other recent project achievements include placing long-term natural resource technical advisors in the Petén and forming a local tourism organization. During the 1992 forest fire season, 12 local communities participated in a fire control campaign. CONAP has signed agreements with local NGOs for resource management activities in the reserve.

Some 170 CONAP park guards are currently involved in public awareness efforts. CARE is identifying additional community extension workers. CONAP and CARE have conducted weekly radio programs and meetings with schools and communities. Press

coverage of the issues facing the reserve has continued, including coverage by Cable Network News and the *National Geographic* magazine.

The project is also aiding in the first steps toward rationalizing forest management. The Petén has been Guatemala's primary source of fine hardwood exports, such as mahogany and Spanish cedar, for more than a century. In 1992 the reserve was closed to lumber companies while technical studies were completed to find ways to improve the management of timber and other natural resources. The halt on lumber exports from the reserve caused the value of standing timber on private land outside the reserve to increase significantly. This increase has boosted incentives for local landowners to manage forests, rather than burn them.

Significant progress has also been made in controlling colonization. Until establishment of the reserves, land in the Petén had been nearly free for the taking. CONAP has begun to control migration into the reserve, setting up outposts in 1990 along the major points of entry. Restricted migration into protected areas has helped strengthen efforts to protect biodiversity and promote sustainable forest management.

6.2.3 Strengthening Parks to Conserve Biodiversity

Biologically significant national parks and reserves in Latin America are benefitting from better on-site management through the *Parks in Peril* project. Since this project began in FY 1990, management and protection activities have been initiated in 20 high-priority protected areas in ten Latin American countries, covering some 12.8 million acres.

Designed by TNC and funded by USAID, the effort has been expanded several times, including cash and in-kind support from TNC and counterpart funds from host countries. The current total project budget is about \$13 million. TNC has been actively involved in

developing and targeting more sustainable funding options, including innovative debt-for-nature swaps, national environmental trust funds, and bilateral debt reduction agreements.

Overall, more than 200 park rangers and community extension agents received on-site training and instruction through the program in FY 1992—a fourfold increase since FY 1991. In several sites, critical baseline biological and socioeconomic surveys and inventories have been completed, and preliminary monitoring programs have been designed and initiated. Innovative national and international conservation partnerships have been developed with universities, indigenous groups, local businesses, and development organizations.

In Bolivia the Amoro National Park was enlarged to 620,000 hectares, following national approval of a petition to enlarge the park's boundaries. Through a link with neighboring Carrasco National Park, a continuous protected area of some 1.2 million hectares was created. Park rangers and a park director have been trained and an environmental education program for local farmers and schoolchildren has been started.

Along Bolivia's border with Brazil, the Noel Kempff National Park has established an effective patrol program and acquired needed equipment for rangers. This has helped reduce illegal commercial fishing, caiman hunting, and turtle egg extraction.

The Parks in Peril project has supported the Dominican Republic's Jaragua National Park, the largest protected area in the insular Caribbean. Today, Jaragua is the country's only park with marked boundaries, a management infrastructure, and strong community development programs. In FY 1992 local communities helped participate in the selection and training process of eight additional park guards. The project has been particularly effective in developing strong community extension programs.

In Mexico's 48,140-hectare El Ocote Ecological Reserve, which protects the northernmost extension of tropical forest in that country, local conservation groups in Chiapas commissioned an environmental impact assessment of a proposed highway between Veracruz and Chiapas. The proposed route would have passed through the reserve and would have separated the reserve from a contiguous forested area. As a result, the highway project is on indefinite hold.

In southwestern Costa Rica, the project has targeted Corcovado National Park on the Osa peninsula, which contains the largest remaining lowland tropical rain forest on Central America's Pacific coast. The area also contains gold in ores and sediments, which has complicated park protection. The project has funded training for the park director. A workshop on Costa Rican conservation law for park guards, other personnel of the Ministry of Natural Resources, Energy, and Mines, and local community members helped open a dialogue on law enforcement. Protection patrols have been strengthened by the purchase of vehicles and radio equipment through the project.

USAID is supporting other parks in the Caribbean through country programs such as Jamaica's (see box 6.3).

6.2.4 Costa Rica: Natural Resource Management and Community Development

USAID's *Forest Conservation and Management Project* (BOSCOSA) targets the areas outside Corcovado National Park on the Osa peninsula, including the Golfo Dulce Forest Reserve, the Guaymi Reserve, and the Golfito Wildlife Refuge. The peninsula has more than 50,000 inhabitants and diverse forests, which are home to more than 2,000 plant species.

Box 6.3

Country Program: Focus on Jamaica

Jamaica is known as “the land of wood and water.” The Caribbean island’s vast natural riches include tropical forests, wetlands, and marine ecosystems. Jamaica also has some of the world’s most diverse coral species. Rapid urban growth and development activities, however, have taken a significant environmental toll, diminishing the country’s biodiversity and depleting its natural resource base. Some 3 percent of remnant forests are lost in Jamaica each year. According to current estimates, almost one-third of all species endemic to Jamaica are endangered, threatened, rare, or already extinct. Because of the accelerating loss of habitat, the situation is likely to get worse.

Jamaica’s population is expected to jump by one million to a total of 3.3 million over the next three decades. Virtually all this growth will occur in and around urban areas and thus is likely to exacerbate current environmental problems such as contaminated water supplies and air pollution. Coastal areas have been particularly hard-hit by unmanaged urban wastes, water pollution and despoiled upstream watersheds. In many areas, more than half the coral reef ecosystems, essential nurseries for Jamaican fisheries, are considered to be biologically dead.

Environmental protection is crucial to the long-term sustainability of certain sectors of the Jamaican economy. Most notable is tourism, which is rapidly becoming the country’s largest and most dependable foreign-exchange earner.

USAID has played a significant role in helping address environmental and natural resource management issues in Jamaica. The Agency’s *Protected Areas Resources Conservation Strategy* (PARCS) project, for example, was initiated in FY 1989 to follow up on the *Jamaica Country Environmental Profile*¹⁰³ prepared two years earlier. That report documented the rapid rate at which natural habitats were being destroyed. USAID support helped produce the follow-up to the profile, the *Jamaican Environment Strategy*, completed in FY 1991, which emphasized the urgent need for improved environmental management.

The three-year PARCS project helped plan and develop two pilot parks—a terrestrial park in the Blue Mountains and a marine park at Montego Bay—the first in a new system of national parks and protected areas in the country. The Montego Bay Marine Park is now one of the few operational protected areas in the Caribbean. Another significant milestone under the PARCS project includes the establishment of a Conservation Data Center, which serves as a national biodiversity data base. A National Parks Trust Fund was also established through a debt-for-nature swap with initial capitalization of \$581,000 equivalent in local currency.

To build and expand on the initiatives of the PARCS project, USAID's **Development of Environmental Management Organizations (DEMO)** project was launched in September 1992. DEMO supports the development of two key nascent Jamaican institutions: the Natural Resources Conservation Authority and the National Environmental Societies Trust. In addition, pilot projects in four areas will be used as "laboratories" to develop model resource conservation programs and management approaches that can be applied throughout Jamaica. The four pilot project sites will be selected from six areas of critical environmental concern: Negril, Montego Bay, Black River, Ocho Rios-Runaway Bay, Portland/Port Antonio, and Kingston-Hellshire. The Enterprise for the Americas Initiative Foundation will provide funding for local environmental initiatives by nongovernmental organizations and community groups (see box 6.1).

The peninsula's economy has long been based on unsustainable resource exploitation. BOSCOA is helping develop and demonstrate alternatives, including natural forest management, ecotourism, and nontimber and secondary forest products that are economically productive and contribute to maintaining forest cover on the peninsula. The project emphasizes close collaboration with local communities, including the development of education programs and economic alternatives to deforestation.

Forest management activities include sustainable timber production and forest conservation through conservation easements, forest trusts, and community forest concessions. These are supplemented by smaller initiatives in carpentry, handicrafts, and ecotourism.

By the end of 1992, land use in nearly 6,500 hectares of the area surrounding Corcovado National Park had improved. Some 290 hectares of degraded pasture lands are being reforested.

Since BOSCOA's inception, more than 186 people have been trained in conservation management and more than 80 training sessions in handicrafts have been conducted for local residents. BOSCOA has helped the region to increase employment in value-added activities.

International donor support is expected to strengthen conservation efforts on the Osa peninsula significantly. USAID support for core expenses has helped BOSCOA assist grass-roots organizations as well as regional initiatives in raising additional funds for conservation projects. Some \$1 million, for example, has already been channeled to 11 grass-roots environmental organizations. Funding from the Swedish International Development Agency will, in part, help secure a funding base through the establishment of an endowment fund. In addition, the peninsula is likely to receive approximately \$4 million from the World Bank's Global Environment Facility to support research, sustainable rural development, training, and institution building.

6.2.5 Costa Rica: Forest Resources for a Sustainable Environment

The *Forest Resources for Sustainable Environment* (FORESTA) project promotes sustainable production from natural forest buffer zones around natural areas of Costa Rica's Central Cordillera, including Braulio Carrillo, Poás, and Irazú National Parks. The project supports protected area management and development of forestry and agroforestry in the buffer zones around these areas. The seven-year, \$7.5 million project was initiated in FY 1989 and is implemented by a local foundation, Fundación para el Desarrollo de la Cordillera Volcánica Central (FUNDECOR).

The project has slated at least 5,000 hectares for management, according to officially approved plans; already, 3,000 hectares are under a forest management plan and some 350 hectares were reforested in FY 1992. The first forest management plan for the area was initiated in February 1992. Baseline data collection on forest cover continues; a geographic

information system has been installed at FUNDECOR; and the first satellite images of the project area are now being digitized. Some 42 park service staff received training in FY 1992. A feasibility study for a regional timber marketing center is under way to help develop an integrated forest industry with access to a sustainable supply of raw materials.

6.2.6 Haiti: Targeted Watershed Management

The Latin American and Caribbean Bureau authorized the *Targeted Watershed Management* project in FY 1986 with a funding level of \$15 million for a period of ten years. It was designed to arrest the process of environmental degradation in southwest Haiti, specifically in the Pic Macaya watershed, which provides water to the Plaine des Cayes—one of the most productive regions in Haiti.

The military coup of September 30, 1991, triggered the suspension of all project activities until the USAID Agricultural Development Office determined that several activities needed to be reactivated to avoid losing the benefits of assistance already provided. As a result, project activities resumed in February 1992. Because of the current political crisis in Haiti and the increased environmental degradation caused by the suspension of all projects after the coup, USAID has amended and extended the project for two years (through September 1994) with an increase in funding levels of \$1.25 million raising the project ceiling to \$16.25 million. The additional funding will ensure continuity in conservation efforts until a prospective \$40 million World Bank project, which was being negotiated before the coup, is activated.

The broad purpose of the project is to promote and incorporate soil conservation and erosion control measures (e.g., stabilizing hillsides with alley cropping, fruit trees, and perennial crops) into local land management practices. In addition to protecting the watershed, these practices have raised income levels; the lessons learned in watershed conservation are being applied to national land management planning.

The original project had two components, Project Save the Soil and the Macaya Biosphere Reserve (Parc Macaya). Four Haitian private voluntary organizations (PVOs) implemented the Project Save the Soil component, supervised by a U.S. firm under contract with the USAID mission in Haiti. In addition to promoting soil conservation, erosion control, and efficient agricultural techniques to increase crop yields, the Haitian PVOs provided extension services to local farmers in the area. Funding for Project Save the Soil has not been renewed since the coup.

The Macaya Biosphere Reserve component, implemented by the University of Florida, aimed to protect and rehabilitate the natural ecosystems, biodiversity, and natural resources of Parc Macaya and the surrounding areas. In addition to being a biologically rich area, Parc Macaya is critical to the country's economic rejuvenation efforts as a watershed above the Cayes Plains. The University of Florida conducted research and rehabilitation activities in the park and provided technical assistance to 1,750 farmers living in areas adjoining the park. This buffer zone was created to establish recognizable boundaries around the park, separating it from the more intensive agricultural areas. Farming activities in the buffer zone included tree farming and other soil conservation activities, such as alley cropping and growing fruit trees. The Macaya Biosphere Reserve activities, although suspended after the coup, were completed in March 1992 as originally planned.

Under the funding extension, the overall goal and purpose of the project remains unchanged. All of the new activities are related only to the Macaya Biosphere Reserve component of the project and provide continued support for the preservation of Parc Macaya, now being implemented by the Haitian PVO Union des Cooperatives de la Region du Sud (UNICORS). Employment generated by the project and farming improvements it introduces will raise income levels and alleviate pressures on the park. Started in February 1993, activities encompass the following:

- *Planting of 600,000 native and endemic tree seedlings in critical areas of the park.* Three tree nurseries were reactivated, producing 400,000 tree seedlings in the first season.
- *Wildlife habitat rehabilitation through the reclamation of 12 kilometers of rapidly eroding ravines in the park.* Assessments conducted under the original project have shown that several gullies urgently need to be reclaimed to allow for safe evacuation of excess runoff and decrease the risk of habitat degradation. The area receives nearly ten feet of annual rainfall. The rehabilitation of the gullies with natural vegetation greatly reduces the risk of mud slides and avalanches. Through UNICORS assistance, farmers living in the buffer zone have built 150 check dams and planted native trees and grasses to stabilize over ten kilometers of ravines.
- *Reactivation of the training and environmental awareness program.* UNICORS is continuing the environmental awareness program initially begun for buffer zone farmers and schoolchildren by providing technical assistance and training to strengthen the Association Pour la Protection du Parc Macaya. This association trains and motivates local farmers and acts as a local interest group to defend the park.
- *Provision of technical assistance to buffer zone farmers' families.* Farmers living in the park periphery are engaged in agricultural practices that sometimes infringe on the park, including slash-and-burn cultivation of new farm fields and animal grazing. UNICORS is working with these farmers to implement land use and agricultural techniques to increase crop and grass production on land already under cultivation, thus limiting the need for new fields and off-farm grazing.
- *Repair and maintenance of critical sections of the access road to Formond.* This road is essential for delivery of services to farmers and access to the park's headquarters. Local farmers are employed as labor for maintenance and repair work.

In July 1993 USAID/Haiti transferred \$416,000 to the *Biodiversity Support Program* (BSP) under the Targeted Watershed Management project. BSP is:

- providing technical assistance and training to UNICORS for community-based integrated conservation and development activities, community-based research, and organizational development, and
- working with UNICORS in promoting participation of as many “stakeholders” as possible in Parc Macaya endeavors. The program supports networking among host country individuals and institutions to share lessons learned.

BSP is assisting in the development of simplified monitoring techniques and the identification of strategic performance indicators of biodiversity conservation, particularly those that might be used at the community level. BSP is also taking the lead in organizing an international round table on conservation in Parc Macaya to link Haitian NGOs to international conservation organizations and funding sources and raise international awareness of the critical strategic importance of the park.

The Targeted Watershed Management project has had several significant impacts. Although the Project Save the Soil component had a short effective life span, several thousand hectares of agricultural land in the watersheds in southwest Haiti now feature improved agricultural and soil and water conservation strategies, such as hedgerows planted on the contour, the use of herbaceous legumes for improved fallow and as intercrops, and the construction of furrows and berms along the contour. Project Save the Soil also raised substantially the level of NGO activity and knowledge of effective technical and management strategies. Other accomplishments include increases in food production and farmer revenue through higher-yielding crops, adoption of appropriate land use and agricultural practices, and improved farmer access to plant materials. Erosion rates have decreased as farmers have adopted velvet beans as a cover crop. Improved agroforestry practices (such as the adoption of fast-growing trees) have increased permanent vegetative cover on the hillsides.

Notes and References

1. U.S. Agency for International Development, *Environment Strategy* (Washington, D.C.: USAID, 1992).
2. U.S. Agency for International Development and the World Resources Institute, *Green Guidance for Latin America and the Caribbean: Integrating Environmental Concerns into A.I.D. Programming* (Washington, D.C.: USAID, 1993), p. 40.
3. U.S. Agency for International Development/Bureau for Latin America and the Caribbean, *The Green Book: An Environmental Policy Sourcebook* (Washington, D.C.: USAID, 1992).
4. U.S. Agency for International Development, *Implementation Guidelines for USAID's Environmental Strategy*, draft (Washington, D.C.: USAID, 1994).
5. U.N. Food and Agriculture Organization, *Forest Resources Assessment 1990: Tropical Countries*, FAO Forestry Paper 112 (Rome: FAO, 1993) pp. 10, 28.
6. USAID, *Environment Strategy*.
7. U.S. Agency for International Development, *Policy Paper on Environment and Natural Resources* (Washington, D.C.: USAID, 1988).
8. U.S. Agency for International Development, *Environment Initiative* (Washington, D.C.: USAID, 1990).
9. U.S. Agency for International Development, *Environmental Strategy Framework* (Washington, D.C.: USAID, 1991).
10. Adapted from: Michael Brown and Barbara Wyckoff-Baird, *Designing Integrated Conservation and Development Projects* (Washington, D.C.: World Wildlife Fund, 1992).
11. International Union for the Conservation of Nature and Natural Resources (IUCN) and the United Nations Environment Programme, World Wildlife Fund, U.N. Food and Agriculture Organization, and the U.N. Educational, Scientific, and Cultural Organization, *World Conservation Strategy* (Gland, Switzerland: IUCN, 1980).
12. Brown and Wyckoff-Baird, *Designing Integrated Conservation and Development Projects*.
13. FAO, *Forest Resources Assessment 1990*, p. 25.
14. Kenton Miller and Laura Tanglely, *Trees of Life* (Boston: Beacon Press, 1991), p. xvii.
15. FAO, *Forest Resources Assessment 1990*.

16. World Resources Institute, *World Resources 1992-93* (New York: Oxford University Press, 1992), p. 177.
17. C. C. Mann, "Extinction: Are Ecologists Crying Wolf?" *Science*, August 16, 1991, p. 738.
18. Norman Myers, *Deforestation Rates in Tropical Forests and Their Climatic Implications* (London: Friends of the Earth, 1989), p. 68.
19. Owen Lynch, "Securing Community-Based Tenurial Rights in the Tropical Forests of Asia: An Overview of Current and Prospective Strategies," *Issues in Development* (Washington, D.C.: World Resources Institute, 1992), p. 2.
20. World Resources Institute and the Tropical Science Center, San José, Costa Rica, *Accounts Overdue: Natural Resource Depreciation in Costa Rica* (Washington, D.C.: World Resources Institute, 1991), p. vii.
21. R. Bossi and G. Cintron, *Mangroves of the Wider Caribbean: Toward Sustainable Management* (Washington, D.C.: Caribbean Conservation Association, United Nations Environment Programme and the Panos Institute, 1990), p. 5.
22. World Resources Institute, World Conservation Union (IUCN) and the United Nations Environment Programme, *Global Biodiversity Strategy: Guidelines for Action to Save, Study, and Use Earth's Biotic Wealth Sustainably and Equitably* (Washington, D.C.: WRI, IUCN, and UNEP, 1992), p. 4.
23. *Ibid.*
24. World Wide Fund for Nature, *The Importance of Biological Diversity: A Statement by the World Wide Fund for Nature* (New Haven: Yale Press, 1989), p. 16.
25. National Research Council, Board on Science and Technology for International Development, *Neem: a Tree for Solving Global Problems* (Washington, D.C.: National Academy Press, 1992), pp. 60-62.
26. Miller and Tanglely, *Trees of Life*, p. xviii.
27. WWF, *The Importance of Biological Diversity*, p. 15.
28. L. Roberts, "Chemical Prospecting: Hope for Vanishing Ecosystems?" *Science*, May 22, 1992, p. 1142.
29. German Bundestag, *Protecting the Tropical Forests: a High-Priority International Task* (Bonn: German Bundestag, 1990), p. 172.
30. Miller and Tanglely, *Trees of Life*, p. xix.
31. C. M. Peters, "Valuation of an Amazonian Rainforest," *Nature*, June 29, 1989, p. 656.
32. K. R. Miller, W. V. Reid, and C. V. Barber, "Deforestation and Species Loss: Responding to the Crisis," in J. T. Mathews, ed., *Preserving the Global Environment: the Challenge of Shared Leadership* (New York and London: W. W. Norton & Company, 1991), p. 97.

33. Miller and Tanglely, *Trees of Life*, p. xviii.
34. Robert Repetto, *The Forest for the Trees?: Government Policies and the Misuse of Forest Resources* (Washington, D.C.: World Resources Institute, 1988), p. 46.
35. German Bundestag, *Protecting the Tropical Forests*, p. 532.
36. World Wildlife Fund, "Tropical Forest Conservation," a WWF position paper (Washington, D.C.: WWF, 1989), p. 8.
37. Omar Sattaur, "Botanical Entrepreneurship," *Ceres*, vol. 23, no. 1 (January/February 1991), pp. 17-21.
38. Miller and Tanglely, *Trees of Life*, p. xviii.
39. WWF, *The Importance of Biological Diversity*, p. 20.
40. J. A. McNeely, K. R. Miller, W. V. Reid, R. A. Mittermeier, and T. B. Werner, *Conserving the World's Biological Diversity* (Washington, D.C.: World Bank, World Resources Institute, World Conservation Union and Conservation International, 1990), p. 66.
41. C. Perrings, C. Folke, and K. G. Maler, "The Ecology and Economics of Biodiversity Loss: The Research Agenda," *Ambio*, vol. 21, no. 3 (May 1992), p. 201.
42. Christine Haugen, personal communication, February 8, 1993.
43. A. D. Johns, "Species Conservation in Managed Tropical Forests," in T. C. Whitmore and J. A. Sayer, eds., *Tropical Deforestation and Species Extinction* (Gland, Switzerland: World Conservation Union, 1992), p. 42.
44. WRI, IUCN, and UNEP, *Global Biodiversity Strategy*, p. 4.
45. H. Kuliopulos, "Amazonian Biodiversity," *Science*, June 15, 1990, p. 1305.
46. K. Lindberg, *Policies for Maximizing Nature Tourism's Ecological and Economic Benefits* (Washington, D.C.: World Resources Institute, 1991), p. 5.
47. The Ecotourism Society, *The Ecotourism Society: Uniting Conservation and Travel Worldwide* (Alexandria, Virginia: The Ecotourism Society, 1991), p. 5.
48. Tensie Whelan, "A Tree Falls in Central America: The Growth of Environmentalism," *Amicus Journal* (Fall 1988), p. 30.
49. Lindberg, *Policies for Maximizing Nature Tourism's Ecological and Economic Benefits*, p. 22.
50. Michael Wells and Katrina Brandon, *People and Parks: Linking Protected Area Management with Local Communities* (Washington, D.C.: World Bank, World Wildlife Fund, and USAID, 1992), p. 35.
51. *Ibid.*, p. 36.

52. *Ibid.*, pp. 34 and 38.
 53. U.S. Agency for International Development, *Ecotourism: A Viable Alternative for Sustainable Management of Natural Resources in Africa* (Washington, D.C.: USAID, 1992), pp. 88–95.
 54. Lindberg, *Policies for Maximizing Nature Tourism's Ecological and Economic Benefits*, p. 27.
 55. Charles Owubah, *Food Aid in Africa: Issues Affecting PVO Natural Resource Interventions* (Washington, D.C.: Food Aid Management Group, 1993).
 56. R. Hagen and J. N. Shores, *Mid-term Evaluation of the Biodiversity Support Program of the Conservation of Biodiversity Project* (Washington, D.C.: TvT Associates, 1991), p. vi.
 57. Genetic Resources Communications Systems, *Diversity* (Bethesda, Maryland: GRCS).
 58. S. Olsen, et al., eds., *Sri Lanka Coast 2000: A Resource Management Strategy for Sri Lanka's Coastal Region* (Narragansett, Rhode Island: University of Rhode Island, Coastal Resources Center, 1993).
 59. Lynne Z. Hale and Enid Kumin, *Implementing a Coastal Resource Management Policy: The Case of Prohibiting Coral Mining in Sri Lanka* (Narragansett, Rhode Island: University of Rhode Island, Coastal Resources Center, 1992).
 60. Jens C. Sorenson, Scott T. McCreary, and Aldo Brandani, *A Guide to Impact Assessment in Coastal Environments* (Narragansett, Rhode Island: University of Rhode Island, Coastal Resources Center, 1992).
 61. A more complete description of this project can be found in USAID, *Environment Program Report, FY 1992–93* (Washington, D.C.: USAID, 1993).
 62. Nancy Forester and David Stanfield, "Tenure Regimes and Forest Management: Case Studies in Latin America," LTC Paper 147, Land Tenure Center, Madison, Wisconsin, March 1993.
 63. J. W. Bruce and M. S. Freudenberger, "Institutional Opportunities and Constraints in African Land Tenure: Shifting from a 'Replacement' to an 'Adaption' Paradigm," draft concept paper, Land Tenure Center, Madison, Wisconsin, 1992.
 64. A more complete description of this project can be found in USAID, *Environment Program Report, FY 1992–93*.
 65. Kirk Talbott, "Elusive Success: Institutional Priorities and the Role of Coordination: A Case Study of the Madagascar National Environmental Action Plan," *Issues in Development*, May (Washington, D.C.: World Resources Institute, 1993).
- Allison Butler Herrick and Jennifer Green, "World Bank Mission on Environment, Tanzania: Institutional Analysis," manuscript (Washington, D.C.: World Resources Institute, 1993).
- Peter Veit, "Decentralizing Natural Resource Management: Some Issues Regarding Sub-District Environmental Planning and Implementation," manuscript (Washington, D.C.: World Resources Institute, 1993).

66. USAID and WRI, *Green Guidance*.
67. Owen J. Lynch, "Securing Community-Based Tenurial Rights in the Tropical Forests of Asia: An Overview of Current and Prospective Strategies," *Issues in Development*, November (Washington, D.C.: World Resources Institute, 1992).
68. World Resources Institute, *Surviving the Cut: Natural Forest Management in the Humid Tropics* (Washington, D.C.: WRI, 1993).
69. U.S. Agency for International Development, *Tropical Forests and Biological Diversity: USAID Report to Congress 1990-1991* (Washington, D.C.: USAID, 1992).
70. Peter H. Freeman and Robert Fox, *Satellite Mapping of Tropical Forest Cover and Deforestation: A Review with Recommendations for USAID* (Arlington, Virginia: USAID, 1994).
71. U.S. Agency for International Development, Bureau for Africa, *Environment Strategy for Africa* (Washington, D.C.: USAID, 1992).
72. R. C. Zimmerman, *Recent Reforms in Natural Resources Management in Africa: Trends in the Roles of Public Sector Institutions* (Washington, D.C.: USAID and the Forestry Support Program, 1992).
73. J. K. Erdmann, *An Analysis of Ten African Natural Resource Management Practices* (Washington, D.C.: USAID and the Forestry Support Program, 1992).
74. World Learning Center, CARE, and World Wildlife Fund, *Non-Governmental Organizations and Natural Resources Management: An Assessment of Eighteen African Countries, Executive Summary* (Washington, D.C.: USAID, 1993).
75. Michael Brown, "Non-Governmental Organizations and Natural Resource Management in Africa's Pastoral Sector: Where To Go From Here?" draft paper for PVO-NGO/NRMS project (Washington, D.C.: USAID, Bureau for Africa, 1993).
76. Brown and Wyckoff-Baird, *Designing Integrated Conservation and Development Projects*.
77. USAID, *Environment Program Report FY 1992-93*, p. 52.
78. Michael A. O'Connell and Michael Sutton, *The Effects of Trade Moratoria on International Commerce in African Elephant Ivory: A Preliminary Report* (Washington, D.C.: World Wildlife Fund, 1990), p. 26.
79. McNeely et. al., *Conserving the World's Biological Diversity*, p. 33.
80. O'Connell and Sutton, *The Effects of Trade Moratoria*, p. 1.
81. *Ibid.*, p. 5.
82. *Ibid.*, p. 21.
83. *Ibid.*, p. 22.

84. World Wildlife Fund, *The Impact of the Ivory Ban on Illegal Hunting of Elephants in Six Range States in Africa* (Washington, D.C.: WWF, 1992), p. 59.
85. E. Linden, "The Last Eden," *Time*, July 13, 1992, pp. 64-65.
86. U.S. Agency for International Development, *Current and Proposed Asia Bureau Projects: Environment, Forests, and Natural Resources 1990-94, a Summary Report* (Washington, D.C.: USAID, 1992), p. 1.
87. WRI, *World Resources 1992-93*, p. 76.
88. John J. Metz, "A Reassessment of the Causes and Severity of Nepal's Environmental Crisis," *World Development*, vol. 19, no. 7 (July 1991), pp. 816-817.
89. USAID, *Current and Proposed Asia Bureau Projects*.
90. USAID, *Environment Program Report, FY 1992-93*, pp. 59-69.
91. Winrock International, *PGR Quarterly Report*, no. 3 (New Delhi: USAID, 1992), p. 19.
92. Winrock International, *PGR Quarterly Report*, nos. 1 & 2, p. 13.
93. FAO, *Forest Resources Assessment 1990*, p. 25.
94. World Resources Institute, *World Resources: 1990-91* (New York: Oxford University Press, 1990), p. 42.
95. USAID, *Green Guidance*, p. 40.
96. *Ibid.*, p. 39.
97. *Ibid.*
98. *Ibid.*
99. U.S. Agency for International Development, Bureau for Latin America and the Caribbean, *Environment and Natural Resource Management in Central America: A Strategy for A.I.D. Assistance* (Washington, D.C.: USAID, 1989), p. 17.
100. This ongoing evaluation of RENARM is being conducted by Management Systems International under contract to USAID. See table 6.1.
101. Claudia Sobrevila and Paquita Bath, *Rapid Ecological Assessment Manual* (Arlington, Virginia: The Nature Conservancy, 1992).
102. USAID, *The Green Book*.
103. Ralph M. Field and Julie E. Troy, *Jamaica Country Environmental Profile* (Washington, D.C.: International Institute for Environment and Development, 1987).

Index by Country or Region

Africa

Botswana	66, 93, 103, 104, 108
Burundi	58, 83
Cameroon	14, 18, 24, 71, 104, 106, 108
Cape Verde	111-113
Congo	48, 106, 108, 109
Ghana	1, 2, 4, 46, 48, 84, 96, 97, 104, 108
Guinea Bissau	34
Kenya	23, 43, 46, 47, 68, 101, 107-108
Madagascar	1, 2, 13, 14, 16, 27, 44, 46, 66, 84, 93, 94-96
Malawi	66, 103, 108
Mali	13, 14, 58, 98, 101, 110-111
Mauritania	84
Mozambique	84
Namibia	66, 69, 71, 103, 104, 108
Niger	22, 43, 67, 108
Rwanda	2, 47, 69, 86, 98, 101, 104-106
Senegal	18, 57, 63, 84, 111, 113-116
Tanzania	65, 86, 107
The Gambia	2, 39, 63, 84, 97, 98
The Zambia	66, 83, 84, 103, 104, 108
Togo	104
Uganda	2, 14, 15, 48, 83, 84, 86, 93, 95, 108
Zimbabwe	66, 67, 100, 103, 104, 108

Asia

Bangladesh	68
Cook Islands	126
Fiji	126, 127
India	38, 60, 68, 121, 129, 130, 132, 134, 147
Indonesia	4, 38, 39, 68, 80, 87, 118, 120, 124
Kiribati	126, 127
Malaysia	97
Nepal	2, 4, 5, 16, 19, 24, 38, 47, 87, 118, 129-135
Pakistan	13, 40, 58, 118
Papua New Guinea	2, 3, 70, 87, 120, 126, 127
Philippines	4, 13, 29, 43, 48, 55, 57, 62, 69, 79, 80, 87, 118, 120, 121, 122-124
Sri Lanka	75, 78-81, 87, 108, 118
Thailand	57, 75, 77-81, 87, 108, 118
Tonga	126, 128
Tuvalu	126, 128

Eastern Europe

Bulgaria	1, 71
----------	-------

Latin America and the Caribbean

Argentina	62, 63, 141
Belize	3, 46, 48, 60, 138, 145, 155, 157, 158
Bolivia	4, 15, 61, 69, 137, 138, 140-142, 154, 161
Brazil	3, 18, 44, 46, 51, 59, 137, 138, 148-150, 161
Chile	57, 63, 141
Colombia	68, 74, 137, 141
Comoros	62
Costa Rica	3, 5, 20, 24, 37, 38, 43, 47, 63, 69, 72, 151, 153-154, 156, 157, 162, 165
Dominica	143, 144
Dominican Republic	63, 161
Ecuador	5, 18, 24, 60, 61, 69, 72, 75, 76-77, 79, 80, 154
El Salvador	1, 3, 80, 138, 140, 141, 157
Grenada	143
Guatemala	3, 4, 18, 24, 45, 48, 58, 60, 65, 67, 74, 82, 151, 152, 155, 156, 157-160
Haiti	29, 166-169
Honduras	3, 63, 65, 138, 140, 156, 157
Jamaica	4, 141, 142, 162, 163-164
Mexico	38, 40, 43, 47-48, 60, 61, 73, 74, 88, 137, 138, 148-150, 155, 158, 162
Montserrat	143
Nicaragua	1, 38, 65, 138, 140, 146, 147
Panama	29, 43, 57, 60, 63, 145-146, 152
Peru	35, 38, 43, 137, 138, 142
Puerto Rico	43, 58
St. Kitts-Nevis	63, 143
St. Lucia	66, 67, 143, 144
St. Vincent and the Grenadines	143
Uruguay	141

Index by Organization

African Wildlife Foundation	108
AFRICARE	105
Agricultural Research Institute (Senegal)	116
Agroforestry Research Network for Africa	53
Alabama A & M University	104
CARE	20, 99, 134, 153, 155, 159
Caribbean Conservation Corporation	147, 156
Center for Applied Social Studies	103
Center for Tropical Agricultural Research and Education	156
Central American Commission on Environment and Development	87, 153, 155
Central American Regional Interparliamentary Commission on Environment and Development	158
Conservation International	18, 46, 96, 101, 153, 156, 159
Consultative Group on International Agricultural Research	2, 29, 40, 52
Cultural Survival Enterprises	17, 18, 46
Development Fund for Africa	91, 99
Environment and Natural Resources Information Center	28, 56
Environment Research Institute (California)	129
Environmental Law Institute	148
Florida A & M University	104
Foundation for the Philippine Environment	123
Fundación Mexicana para la Educación Ambiental	149
Fundación Miguel Aleman	149
Fundación para el Desarrollo de la Cordillera Volcánica Central	165
Global Environment Facility	14, 60, 134, 138, 165
Indian Council of Agricultural Research	122
Institute for Natural Resources and Environment (Nicaragua)	147
Institute of Agronomic Research (Cameroon)	104
Institute of Forestry of Tribhuvan University	133
Inter-American Foundation	141
International Board on Plant Genetic Research	52
International Union for the Conservation of Nature (World Conservation Union)	134
International Council for Research in Agroforestry	52
International Maize and Wheat Improvement Center	73
King Mahendra Trust for Nature Conservation	134
Land Tenure Center (University of Wisconsin-Madison)	83
MIKUPIA	65, 148
National Aeronautics and Space Administration	21, 51, 109
National Bureau of Plant and Genetic Resources (India)	121
National Council for Protected Areas	158
National Fund for the Environment (Bolivia)	15, 142
National Geographic Society	110, 160
National Institute for Biodiversity (Costa Rica)	38, 72
National Institute of Renewable Natural Resources (Panama)	145
National Institutes of Health	52
National Science Foundation	20, 67, 94

Peace Corps	3, 9, 20, 54, 56, 57, 61-62, 63, 107, 109, 121, 153
Peruvian Foundation for the Conservation of Nature	142
PRONATURA	150
Rwandan National Environmental Service	106
Save the Children Federation	134
Smithsonian Institution	44, 96
Southeastern Center for Forest Economics Research	59
Southern Africa Development Coordinating Committee	18, 48, 102, 108
Swedish International Development Agency	165
The Nature Conservancy	20, 70, 88, 120, 142, 153, 155, 159, 160
U.S. Department of the Treasury	141
U.S. Department of Defense	107
U.S. Department of State	107, 141
U.S. Department of Agriculture	141
U.S. Environmental Protection Agency	21, 141, 153
U.S. Fish and Wildlife Service	107
U.S. Forest Service	21, 56, 110, 114, 121
United Mission to Nepal	134
United Nations Development Programme	80, 97
United Nations Education and Scientific Organization	51
United Nations Environment Programme	80
University of California	73, 74
University of Maryland	21, 104
University of Rhode Island	75, 79
University of Wisconsin	69
University of Wisconsin-Madison	83
Winrock International	52
Woodlands Mountain Institute	134
World Bank	96, 134
World Conservation Union (International Union for the Conservation of Nature)	134
World Learning Center	14, 99
World Neighbors	66
World Resources Institute	3, 20, 70, 85, 89, 120, 153
World Wildlife Fund	1, 20, 24, 44, 64, 70, 72, 99, 103, 120, 123, 144, 150
Zim Trust	103

Index by Project

Access to Land, Water, and Other Natural Resources II	23, 83
Action Program for the Environment	95
Agriculture and Natural Resources Management (Gambia)	97
Agriculture and Rural Development Technical Services	154
Agroenterprise and Technology Systems	135
Biodiversity Support Program	68, 70, 94, 120, 168
Cape Verde Watershed Development	112
Coastal Resources Management	75
Community-Based Natural Resources Management (Senegal)	114
Conservation of Biological Diversity	67
Conservation of Northern Forests (Congo)	106
Development Strategies For Fragile Lands II	81
Employment and Natural Resource Sustainability (Peru)	142
Environment and Coastal Resources	143
Environment and Global Climate Change Program	148
Environment and Natural Resources Protection (El Salvador)	140
Environmental Planning and Management	85
Forest Conservation and Management Project (Costa Rica)	72, 162
Forest Resources for Sustainable Environment (Costa Rica)	165
Forest Resources Management	52
Forest Resources Management II	54, 56
Forestry and Land Use Planning	43
Forestry Development Project (Nepal)	132
Forestry/Fuelwood Research and Development	52
Forestry Support Program	55, 94
Innovative Science Research II	69
Knowledge and Effective Application of Policies for Environmental Management	94
Living in a Fragile Environment	103
Mahaweli Agriculture and Rural Development	108
Mali Environmental Support Program	111
Market and Technology Access Project	61
Maya Biosphere Natural Resource Management Project	158
National Environmental Protection Fund Project (El Salvador)	140
Natural Resource Conservation and Historic Preservation Project	96
Natural Resource Management and Protection (Belize)	145
Natural Resource Management Project (Rwanda)	101, 104
Natural Resources and Environmental Policy Project	79
Natural Resources Management Program (Philippines)	122
Natural Resources Management Project (Indonesia)	124
Natural Resources Management Project (Nicaragua)	146
Natural Resources Management Project (Panama)	145
Natural Resources Management Support (NRMS)	73, 98
Natural Resources-Based Agricultural Research	116

P.L. 480 Title III Natural Resources Policy Reform	115
Pacific Islands Marine Resources	125
Parks in Peril	160
Planning and Assessment for Wildlife Management	108
Plant Genetic Resources	121
Policy, Analysis, Research, and Technical Support	93
Profitable Environmental Protection	129
Project Noah	73
Protected Areas Resources Conservation Strategy	70, 163
PVO Co-Financing II (Nepal)	133
Rapti Development Project (Nepal)	134
Regional Environmental and Natural Resources Management	45, 82, 151
Roots and Tubers Research Project	104
Senegal Reforestation Project	113
Southern Africa Development Coordinating Committee Regional Natural Resources Management	102
Sustainable Approaches to Viable Environmental Management	27, 95
Sustainable Forestry Management (Bolivia)	140
Sustainable Income and Rural Enterprise Program	135
Sustainable Uses for Biological Resources	72
Targeted Watershed Management (Haiti)	166
United States-Asia Environmental Partnership	120
Village Reforestation (Mali)	110
Wildlands and Human Needs Program	64

Appendix A:

Tropical Forest and Biodiversity Conservation Project List, FY 1992-93

The following list presents information about USAID's projects active during FY 1992 and/or FY 1993 that support tropical forest and biodiversity conservation activities. These projects meet one or both of the following conditions:

- The forest and biodiversity conservation component for FY 1992 or FY 1993 was 20 percent or greater of the project's total obligations.
- The project's forest and biodiversity obligations for FY 1992 or FY 1993 totalled \$500,000 or more.

Several projects with significant forestry/biodiversity components that do not meet the above conditions are included in the list because of their noteworthy contribution to the portfolio.

To develop these analyses, ENRIC staff used activity and special interest codes that have been applied to all USAID projects since FY 1989. USAID project staff characterize each project by one or more standard activities, e.g. forestry, each of which is represented by an activity code (AC). Each year this code is assigned a percentage figure reflecting the activity's share of the total project obligations for that year. Activity codes may be further defined by attaching special interest codes (SI), (e.g. biological diversity, natural forest management), which are also assigned funding percentages. These AC/SI codes are part of the project records which are maintained in the Program Budget Data System (PBDS), USAID's primary data base for tracking its financial obligations. USAID's Policy and Finance Directorates have defined certain codes and combinations of codes, or aggregates, for identifying obligations towards various environmental and energy activities, including forest and biodiversity conservation.

USAID's forest and biodiversity conservation aggregate consists of the following codes:

Activity Codes:

EVFR Forestry

Special Interest codes:

AGF Agroforestry

NFM Natural Forest Management

REF Reforestation

BDV Biological Diversity

Explanatory Notes Regarding Columns in the Project List

Project Number, Title and Mission/Office

These data are all taken from USAID's Program Budget Data System (PBDS).

Primary Implementing Organization(s)

ENRIC staff gathered this information through contacts with USAID and other project personnel.

Planned LOP

Planned life-of-project funding represents the total amount of funding planned to be allocated to the project over its funding years.

Funding years

The "funding years" column refers to the years during which obligations were planned to be made. Project activities often continue beyond the obligation years, financed

from unexpended obligations. The list includes some projects still active in FY 1992 and FY 1993 even though the obligation period has passed.

1992-93 Obligations \$000's %

“%” refers to the percentage of a project’s obligations which address forest and biodiversity conservation issues, while the dollar amount (“\$”) is this percentage of the project’s total obligations for that year. The percentage values are derived from the project’s AC/SI coding.

Activities

This column lists those project’s activities relevant to this report.

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-187

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
Africa										
625-0955	Manantali Resettlement	Africa Regional	Peace Corps	18,835	1984-92	150	30	0	0	tree nursery/orchard development
698-0467	* Natural Resources Management Support	Africa Regional	International Resources Group; Amex, Inc.; World Learning; CARE; World Wildlife Fund	21,953	1987-92	516	72	0	72	biodiversity conservation; land tenure policy reform; environmental education; natural forest conservation; NGO institution strengthening; buffer zone mgt; ecotourism; gender analysis; protected areas mgt; natural resource assessment; development of mission action plans
698-0478	* Policy Analysis Research & Technical Support (PARTS)	Africa Regional	Seven collaborating PVOs, universities and consulting firms: Biodiversity Support Program; National Science Foundation	73,800	1992-98	553	10	964	12	policy analysis; analysis of conservation impacts; innovative research; information dissemination
686-0276	Pilot Village Natural Resources Management	Burkina	AFRICARE	1,500	1989-90	0	25	0	25	community-based natural resource mgt; institution strengthening (NGOs)
631-0066	Agriculture Education II	Cameroon	Ministry of Agriculture, Planning and Regional Development	4,623	1991-92	734	28	0	23	environmentally sustainable agriculture; gender analysis; policy reform
631-0058	* Roots and Tubers Project	Cameroon	Univ. of Maryland - Eastern Shore	9,239	1986-92	0	0	0	0	genetic diversity conservation; genetic improvement; seed multiplication
655-0006	* Watershed Development	Cape Verde	Oregon State Univ.	6,275	1985-87	0	0	0	0	watershed management; remote sensing; soil conservation; water conservation; water harvesting; agricultural extension
679-0008	* Conservation of Northern Forests	Congo	Wildlife Conservation International	1,900	1991-93	700	100	700	100	protected area mgt; environmental education; biodiversity conservation; buffer zone mgt; environmental law

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

45

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-188

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
635-0235	* Agriculture and Natural Resources - NPA	Gambia	Ministry of Natural Resources and Environment	10,000	1992-96	0	0	0	0	policy & institutional reform; environmental action plan implementation
635-0236	* Agriculture and Natural Resources - PA	Gambia	Ministry of Natural Resources and Environment	12,050	1992-96	0	0	0	0	institutional strengthening & training; information systems; data collection; environmental education; community-based resource management
641-0122	* Natural Resources Conservation/Historic Preservation	Ghana	Conservation International; Smithsonian; MUCIA; Debt-for-Nature Coalition	8,622	1991-95	1,380	60	666	60	ecotourism; protected area management; historic site preservation; debt-for-nature swaps; biodiversity conservation; private sector investment; nontimber forest production; buffer zone management
675-0219	Natural Resources Management	Guinea	Chemonics, International	11,800	1991-93	80	20	350	25	agroforestry; soil conservation; environmentally sustainable agriculture; biodiversity conservation
615-0247	Conservation of Biodiverse Resource Areas (COBRA)	Kenya	Development Alternatives, Inc.; Kenya Wildlife Service	7,000	1992-96	1,500	100	653	45	agroforestry; environmental education; wildlife mgt; protected areas mgt
687-0112	Debt-for-Nature Swap	Madagascar	World Wildlife Fund	2,500	1989-92	1,185	79	0	44	biodiversity conservation; debt-for-nature swaps; environmental education; protected area management
687-0113	* Knowledge and Effective Application of Policies for Environmental Management (KEAPEM) PA	Madagascar	Madagascar National Office of the Environment; USAID	9,000	1992-94	2,700	90	4,500	90	institution strengthening (gov't); policy reform; short-term training; logging reform

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

181

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligations ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
687-0115	• Knowledge and Effective Application of Policies for Environmental Management. (KEAPEM) NPA	Madagascar	Malagasy Ministry of Finance; USAID	27,000	1992-94	15,000	100	8,000	100	biodiversity conservation; natural forest mgt; policy reform; environmental education; economic development; protected area mgt; national environmental endowment; NEAP implementation
687-0110	• Sustainable Approaches Via Environmental Management (SAVEM)	Madagascar	Private Agencies Collaborating Together (PACT); Tropical Research and Development, Inc.	40,000	1990-95	4,000	100	2,960	40	protected area management; GIS; biodiversity conservation; buffer zone management; community-based conservation; forest protection
612-0235	Agricultural Sector Assistance Program PA	Malawi	Washington State University	15,000	1991-96	507	15	906	17	agricultural policy research and reform; land tenure analysis; agroforestry; environmental monitoring
688-0267	• Mali Environmental Support	Mali	Mali National Forest Service	7,000	1994-98	0	70	0	35	environmental management; forest management; policy analysis; environmental monitoring; environmental education
688-0247	PVO Co-Financing	Mali	WorldVision; CARE	30,040	1989-95	0	0	1,320	15	land regeneration; tree planting; agroforestry; range management
688-0937	• Village Reforestation	Mali	USAID	2,766	1983-92	445	100	0	100	tree planting; nontimber forest production; environmental education; soil conservation; policy reform; land use planning; natural forest management
683-0257	Agricultural Sector Development Grant II NPA	Niger	Government of Niger	20,000	1990-96	0	49	0	29	land tenure analysis and reform; agroforestry
683-0265	Agricultural Sector Development Grant II PA	Niger	International Resources Group	7,972	1990-95	900	36	250	25	environmentally sustainable agriculture; biodiversity conservation; agroforestry

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$/000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-190

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
683-0278	Goure NRM Interventions	Niger	AFRICARE	5,000	1992-96	500	50	0	0	community-based natural resources mgt; soil conservation; institution strengthening
696-0138	* Natural Resource Management (NRMP)	Rwanda	AFRICARE; Wildlife Conservation International; CARE; Development Associates International	10,000	1992-94	0	0	0	0	biodiversity conservation; natural forest mgt; soil conservation; agroforestry; environmental impact assessment; resource inventory; ecotourism; environ. educ.; GIS; development of forestry action plan; seed dispersal; gender analysis
685-0305	* Community-based Natural Resources Management (CNRM)	Senegal	tdb	25,500	1993-99	0	56	4,500	90	applied forestry research; NEAP development; agroforestry; small business development; on-farm tree planting; natural forest regeneration
685-0302	Kaolack Agricultural Enterprise Development	Senegal	AFRICARE	8,000	1992	4,880	61	0	0	agroforestry (living fences, wind breaks, in-field trees); village agriculture-based enterprises
685-0285	* Natural Resource-Based Agric. Research	Senegal	Africaine d'Ingenierie pour le Development	19,750	1991-97	0	0	0	0	institutional strengthening; sustainable agriculture; inventory of natural resource technologies
685-P480	* P.L. 480 Title III Natural Resources Policy Reform	Senegal		30,000	1992-94	0	0	0	0	forest policy reform; institutional development; community-based management; monitoring
685-0283	* Senegal Reforestation	Senegal	Southeastern Consortium for Intl. Development	14,000	1986-92	2,000	100	0	100	agroforestry; soil conservation; community-based forestry; tree planting; forest product marketing; land and tree tenure analysis
690-0251	* Natural Resources Management	Southern Africa Reg.	Chemonics Int'l; Zim Trust; Center for Applied Social Studies (CASS); World Wildlife Fund	38,458	1985-95	8,900	100	3,100	100	protected area mgt; wildlife mgt; environ. education/training; nontimber forest production; ecotourism; policy reform; wildlife utilization; community-based conservation; wildlife research

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tdb = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-191

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
621-0171	* Planning and Assessment for Wildlife Management (PAWM)	Tanzania	African Wildlife Foundation	2,500	1990-91	0	100	0	100	wildlife mgt; population research and planning; protected area mgt; institution strengthening (gov t); wildlife research; development of information systems
617-0123	* Action Program for the Environment (APE) NPA	Uganda	Gov't of Uganda	10,000	1991-95	2,000	40	0	57	protected area management; ecotourism; gender analysis
617-0124	* Action Program for the Environment (APE) PA	Uganda	Tropical Research and Development, Inc.	17,115	1991-95	2,920	73	3,950	79	development of a NEAP; protected area rehabilitation and management; environ. info. systems; institution strengthening (PVO/NGOs)

Asia

499-0004	* Environmental Support Project (ESP), Phase I	Asia Regional	USAID	5,324	1991-94	1,100	50	1,000	50	policy reform; forest mgt; biodiversity conservation; environmental education
499-0015	* U.S. - Asia Environmental Partnership (USAEP)	Asia Regional	Tropical Research & Development	100,000	1992-96	2,277	20	4,941	20	biodiversity conservation; environmental quality control; trade development; economic development; information networking and dissemination
879-0020.82	* Pacific Islands Marine Resources (PIMAR)	Fiji	RDA International, Inc.	900	1990-94	180	60	180	60	marine resources production and development; coastal resources marketing development
386-0513	* Plant Genetic Resources	India	National Bureau of Plant and Genetic Resources	18,700	1988-95	4,050	90	0	90	genetic improvement; genetic diversity conservation; genetic resources management
497-0362	* Natural Resources Management	Indonesia	U.S. Forest Service; Associates in Rural Development	30,000	1990-97	0	15	1,320	40	coastal resources mgt; fisheries production; economic development

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-192

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
497-0364	Strengthening Institutional Development	Indonesia	The Asia Foundation; World Wide Fund for Nature; Helen Keller Int'l	45,000	1991-97	1,335	25	0	0	gender analysis; NGO institution strengthening
367-0160	* Agroenterprise and Tech Systems	Nepal	Chemonics Intl.; Natl. Agr. Research Ctr.; Nepalese Chambers of Congress & Industry	7,980	1990-95	0	0	0	0	private sector and institutional strengthening; agricultural research
367-0158	* Forestry Development	Nepal	Ministry of Forests and Environment; Chemonics Intl.	6,250	1989-93	0	80	0	80	policy and legal reform; institution strengthening (gov't); information systems development
367-0154	* Institute of Forestry	Nepal	Yale School of Forestry and Environmental Studies	4,600	1987-95	0	100	0	100	institution strengthening (univ.); community-based forest management; teacher training; university infrastructure development
367-0159	* PVO Co-Financing II	Nepal	Various PVOs/NGOs	16,000	1992-92	191	5	25	2	agroforestry; institution strengthening (PVOs); biodiversity conservation; protected area establishment; policy analysis; wildlife research
367-0155	* Rapti Development	Nepal	Ministry of Local Development; Ministry of Forests and Environment	16,818	1987-93	558	20	0	20	forestry production; community-based forest mgt; institution strengthening
367-0167	* Sustainable Income and Rural Enterprise	Nepal	USAID	60,000	1993-01	0	0	2,087	26	management of common property resources; forest and land tenure analysis; policy reform; environmental education/training; community-based natural resource management; institution strengthening; agroforestry; tree plantation management; ecotourism; development of forest enterprises

* Projects described in this report

^a NPA = Non-project Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-193

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
391-0481	Forestry Planning and Development	Pakistan	Winrock International	27,500	1983-91	0	63	0	63	reforestation; afforestation; plantation forestry; agroforestry; gender analysis; fuelwood management; farm forestry
391-0485	NWFP Area Development	Pakistan	Dadi Associates, Limited; Asian Institute of Technology	54,911	1983-91	0	25	0	40	watershed management.; reforestation; agricultural diversification
492-0395	Enterprise in Community Development	Philippines	Louis Berger Int'l, Inc.; Development Alternatives, Inc.	14,000	1986-93	281	25	469	25	policy reform; community development; forest management
492-0469	Enterprise in Community Development	Philippines	tbd	0	1994-97	0	0	0	25	technical assistance; training in agriculture, forestry and fishing
492-0444	* Natural Resources Management Program (NRMP)	Philippines	World Wildlife Fund; Louis Berger Int'l, Inc.; Development Alternatives, Inc.	125,000	1990-94	32,005	97	16,720	88	policy reform; debt-for-nature swaps; community-based forestry; protected area management; extractive use of forest products; land tenure analysis
492-0470	PVO Co-Financing IV	Philippines	Various PVO/NGO's	33,000	1993-97	0	0	1,550	24	
879-0020	* Pacific Islands Marine Resources (PIMAR)	South Pacific Reg.	RDA International, Inc.	20,800	1990-98	450	60	128	6	coastal resources mgt; fisheries production; economic development
879-0023	* Profitable Environmental Protection (PEP)	South Pacific Reg.	Foundation for the Peoples of the South Pacific	4,400	1991-95	871	100	500	100	biodiversity conservation; economic development
879-0099	* South Pacific Fisheries Development	South Pacific Reg.	South Pacific Commission	5,450	1986-92	0	42	0	0	marine fisheries research; fisheries monitoring & inventory
383-0109	* Natural Resources and Environmental Policy	Sri Lanka	International Resources Group; University of Rhode Island	19,000	1990-97	69	8	192	8	institution strengthening (gov't); environmental assessment training; public environmental ed.; natural resource mgt.

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-194

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
Central & Eastern Europe										
180-0039	Improved Public Sector Environmental Services	East European Reg	Biodiversity Support Program; National Park Service	68,835	1991-96	921	9	0	0	conservation planning; park management training
Latin America & the Caribbean										
505-0043	* Natural Resources Management and Protection	Belize	tbd	8,500	1991-95	1,218	58	921	38	environmental impact assessment; remote imagery; natural forest management
511-0621	* Sustainable Forestry Mgt Project (BOLFOR)	Bolivia	Chemonica, International	15,000	1993-99	0	48	1,603	54	soil and water conservation; forest production & protection; natural forest mgt
538-0171	* Environmental & Coastal Resource Managemt (ENCORE)	Caribbean Regional	Organization of East Caribbean States; World Wildlife Fund	13,000	1991-98	2,614	64	1,344	64	community-based natural resource mgt; protected area mgt; forestry enterprises
597-0035	Development of Environmental Management Systems	LAC Region	Caribbean Conservation Corporation	1,227	1988-89	0	36	0	0	biodiversity inventories; parataxonomy training; park mgt.; ethnobotanical research; endangered species protection
515-0255	* Forest Conservation and Management (BOSCOSA)	Costa Rica	Fundacion Neotropica	1,900	1990-95	0	100	300	100	ecotourism; biodiversity conservation; natural forest mgt; environ. education; nontimber forest production; conservation easements; community-based forest mgt
515-0243	* Forest Resources for a Sustainable Environment (FORESTA)	Costa Rica	Fundacion Para el Desarrollo de la Cordillera Volcanica (FUNDECOR)	7,500	1989-96	0	0	0	0	buffer zone management; protected area management; natural forest mgt; agroforestry; remote imagery and GIS
515-0263	Forestry Regulations for Sustainable Development	Costa Rica	tbd	2,000	1993-95	0	0	400	100	sustainable forest management

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

1/93

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-195

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
515-0262	Organization for Tropical Studies Program	Costa Rica	Organization for Tropical Studies; Duke University	800	1992-95	500	100	0	0	research on native tree species; tropical forest ecology and natural forest management
518-0051	Agric. Sector Reorientation Program	Ecuador	Sigma I	13,140	1985-95	250	20	215	20	policy reform, formulation and implementation; agroclimatic impact assessment; natural forest mgt
936-5518	* Coastal Resources Management	Ecuador	Univ. of Rhode Island	250	1992-93	900	75	42	42	coastal resources mgt; resource inventory; policy reform; land tenure analysis
518-0107	Conservation of Biological Resources in the Galpagos Islands	Ecuador	Charles Darwin Foundation	200	1991-92	100	100	0	100	biodiversity conservation; botanical research
518-0117	Environmental Education	Ecuador		2,500	1993-96	0	0	300	100	environmental education
518-0079	Environmental Education III-OPG	Ecuador	Fundacion Natura	1,100	1988-93	0	100	0	100	environmental education
518-0023	Forestry Sector Development	Ecuador	National Forestry Program of the Government of Ecuador	7,799	1982-91	0	100	0	100	productive forest research; protected area mgt.; agroforestry; arid zone reforestation; plantation forestry
518-0069	* Sustainable Uses for Biological Resources (SUBIR)	Ecuador	CARE	9,000	1991-97	1,148	100	618	100	biodiversity conservation; protected area mgt; ecotourism; buffer zone mgt; resource inventory; agroforestry; ethnobotanical research; nontimber forest production; soil conservation
519-0385	* Environment/Natural Resources Protection	El Salvador	tbd	20,000	1993-96	0	40	2,560	40	mangrove ecosystem management; watershed mgt; coastal resources mgt; policy reform; environmental education; NGO institution strengthening
520-0274	Highlands Agricultural Development	Guatemala	Louis Berger International, Inc.	37,600	1983-93	225	15	0	15	soil conservation; reforestation; hillside irrigation; watershed mgt; agroforestry

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-196

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
520-0404	Improved Environmental & Natural Resources Management	Guatemala	tbd	8,000	1993-96	0	61	1,126	55	on-farm research & extension in sustainable agriculture; watershed management; protected area policy & management
520-0395	* Maya Biosphere Natural Resources Management	Guatemala	Conservation International; The Nature Conservancy; CARE; Rodale Institute	10,500	1990-96	1,727	96	240	96	forest biodiversity conservation; nontimber forest production; ecotourism; agroforestry; buffer zone management; debt-for-nature swap; archeological preservation
521-0216	Coffee Revitalization	Haiti		5,340	1990-95	0	0	499	58	
521-0217	Productive Land Use Systems Project	Haiti	CARE; Pan American Development Foundation	30,000	1990-95	5,588	75	2,094	75	agroforestry; environmental education; soil conservation; NGO institution strengthening
521-0191	* Targeted Watershed Management	Haiti	UNICORS	16,250	1986-96	157	100	55	100	soil conservation; alley cropping; tree production; watershed management.
522-0246	Forestry Development	Honduras	U.S. Forest Service	20,000	1988-95	0	55	1,728	64	forest management; soil conservation; environ. education; NGO institution strengthening; silviculture
522-0292	Land Use Productivity Enhancement (LUPE)	Honduras	Associates in Rural Development	20,000	1989-97	0	23	299	13	hillside agriculture; watershed management; gender analysis; sustainable agriculture; agroforestry
522-0385	* National Environmental Trust Fund	Honduras	tbd	10,000	1993-97	0	0	2,102	100	protected area mgt; reforestation; watershed management; environmental education and communication
532-0173	Development of Environmental Management Organizations (DEMO)	Jamaica	Ministry of Tourism and Environment; Natural Resources Conservation Authority	9,750	1992-97	595	85	1,778	85	coral reef conservation; biodiversity conservation; watershed mgt; coastal resources mgt; protected area mgt; debt-for-nature swaps; water pollution
532-0148	* Protected Areas Resource Conservation (PARC)	Jamaica	The Nature Conservancy; Univ. of the West Indies; Jamaica Conservation & Development Trust	2,451	1989-92	500	100	0	100	coral reef conservation; biodiversity conservation; watershed mgt; coastal resources mgt; protected area mgt; debt-for-nature swaps; water pollution

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-197

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
598-0784	* Environment/Global Climate Change	LAC Regional	Various grantees	2,800	1990-94	5,909	70	4,983	52	global climate change research; buffer zone protected area management; reforestation; natural forest and plantation management; community-based forestry; environmental law; land tenure policy reform
598-0780	* Environmental Support	LAC Regional	USDA; Chemonics, International	12,000	1990-95	589	40	610	38	environmental impact assessments; global climate change research; biodiversity conservation; policy reform
598-0795	Neotropical Migratory Bird Conservation	LAC Regional	National Fish and Wildlife Foundation	1,250	1991-93	0	100	750	100	wildlife management; biodiversity conservation; environmental education; habitat protection
598-0782	* Parks In Peril	LAC Regional	The Nature Conservancy	12,979	1990-94	3,000	100	5,000	100	protected area mgt; biodiversity conservation; environmental education; community development; resource inventory; debt-for-nature swaps
598-0654	* Rural Development Technical Services (LACTECH)	LAC Regional	USDA Office of Intl. Cooperation & Development; Chemonics Intl.	8,300	1988-C	228	15	105	15	policy analysis/formulation; natural resources; livestock; agribusiness and trade development; agricultural research/extension/education; plant quarantine treatment; rural financial markets; food needs
524-0314	* Natural Resources Management	Nicaragua	Nicaraguan Institute of Natural Resources (IRENA)	9,000	1991-96	0	89	0	88	coastal resources mgt; biodiversity conservation; wetland conservation; forest and land use planning; environmental quality regulation; coral reef conservation; institution strengthening; integrated pest mgt; institution strengthening (gov't); policy reform; environmental education; community-based conservation

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-198

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
524-0313	PVO Co-Financing	Nicaragua	Development Associates, Inc.	21,000	1991-96	0	19	833	15	agroforestry; biodiversity conservation; community-based natural resource management; policy analysis; gender analysis; NGO institution strengthening
525-0308	* Natural Resources Management	Panama	Ministry of Agriculture and Cooperatives	15,000	1991-95	3,000	100	2,000	100	watershed management; protected area management; wildlife management; environmental impact assessment; resource inventory; debt-for-nature swaps; policy reform; environmentally sustainable agriculture; buffer zone management; environmental education; soil conservation
527-0341	* Employment and Natural Resource Sustainability	Peru	The Nature Conservancy	3,600	1991-93	0	100	295	20	land use planning; economic development; extractive use; agroforestry; biodiversity conservation
596-0150	* Regional Environmental & Natural Resource Mgt. (RENARM)	ROCAP	CATIE; The Nature Conservancy; CARE; Wildlife Conservation International; Cultural Survival	48,500	1989-95	2,137	42	1,984	32	policy reform; biodiversity conservation; sustainable agriculture and forestry; resource inventory; wildlife management; coastal resources management; ecotourism; environmental education

New Independent States

110-0003	Environmental Policy and Technology	NIS	NIS Task Force; US EPA; ISAR; CH2M Hill; Harvard Inst. for Intl. Development	112,000	1992-97	0	30	3,000	25	environmental policy formulation; institution strengthening (gov't & NGO); private sector support in environmental technologies; public environmental awareness
----------	-------------------------------------	-----	--	---------	---------	---	----	-------	----	---

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-199

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
Research & Development										
931-1328	CRSP: Small Ruminants	Agriculture	Univ. California & 13 other U.S. universities	70,366	1978-95	0	0	820	10	agricultural research & production
936-4111	International Agricultural Research Centers (IARCS)	Agriculture	Consultative Group on International Agricultural Research (CGIAR)	0	1968-C	1,146	33	610	10	agricultural technology development; genetic research; agroforestry research; information dissemination
936-5451	Implementing Policy Change	Economic & Inst Dev	MSI, Inc.; Arizona State University	14,407	1990-95	648	12	611	12	technical assistance and training in natural resources policy implementation; policy research
936-5453	* Access to Land, Water & Other Natural Resources (ACCESS)	Economic & Inst Dev	Land Tenure Center (LTC) at Univ. of Wisconsin	7,149	1989-98	486	74	348	40	land tenure reform; agroforestry; protected area management; buffer zone management; information networking; rapid rural appraisal; community-based conservation; sustainable forest management; policy analysis and reform
936-5438	* Development Strategies for Fragile Lands (DESFIL)	Economic & Inst Dev	Chemonica, Int'l	5,007	1986-95	120	30	159	30	conservation of fragile lands, rainforest conservation; agroforestry; soil conservation; natural forest mgt; sustainable agriculture; land tenure reform; gender analysis; policy analysis
936-5518	* Coastal Resources Management	Env & Nat Resources	University of Rhode Island	13,800	1988-94	900	75	900	75	coastal resources mgt; resource inventory; policy analysis and development; coastal mgt plan development and implementation; water pollution control; coral reef mgt

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-200

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations \$ 000's	%	1993 Obligations \$ 000's	%	Activities
936-5554	* Conservation of Biological Diversity	Env & Nat Resources	Biodiversity Support Program (World Wildlife Fund with The Nature Conservancy and World Resources Institute); National Science Foundation	40,000	1988-97	5,433	100	5,653	100	biodiversity conservation; information networking; NGO institution strengthening; community-based conservation; environ. educ.; protected areas management; forest rehabilitation; sustainable forest management; wildlife management; ecotourism; gender analysis; resource inventory; debt-for-nature swaps; global climate change research; GIS
936-5517	* Environmental Planning and Management (EPM)	Env & Nat Resources	World Resources Institute; Datex, Inc.	23,000	1982-93	716	16	903	16	NGO institutional strengthening; biodiversity conservation; natural forest management; global climate change research; policy analysis
936-5555	Environmental/Natural Resources Policy & Training (EPAT)	Env & Nat Resources	Midwest Universities Consortium for Int'l Activities Inc. (MUCIA); Winrock International	35,500	1991-00	1,025	30	1,200	30	policy analysis; NGO institution strengthening; debt-for-nature swaps; natural forest mgt; watershed mgt; sustainable agriculture; development of NEAP; biodiversity conservation
936-5556	* Forest Resources Management (FRM II)	Env & Nat Resources	U.S. Forest Service; U.S. Peace Corps	25,000	1991-99	3,111	93	3,144	93	forest-based private enterprise; agroforestry; protected area mgt; buffer zone mgt; policy analysis; watershed mgt; community-based forestry; forest mgt training; gender analysis; forest resource marketing; environ. impact assessment; biodiversity conservation; environmental education; wildlife management; NGO institutional development

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-201

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
936-5547	* Forestry/Fuelwood Research & Development (F/FRED)	Env & Nat Resources	Winrock International	20,932	1985-94	2,297	95	1,425	95	natural forest management; fuelwood conservation; agroforestry; production of multipurpose tree species; information networking; on-farm trials; gender analysis; nontimber forest production
936-1421	AID/Peace Corps Small Project Assistance	Program Office	Peace Corps	0	1985-C	770	35	726	35	natural forest mgt; rural development; institution strengthening for PVOs/NGOs
936-5545	Applying R&D to Development	Research	International Academy of Science	11,894	1988-93	843	20	276	20	multipurpose tree species; agroforestry
936-5600	* Innovative Scientific Research II	Research	National Science Foundation; Various research grantees	48,000	1990-99	1,282	20	648	20	biotechnology research; biodiversity conservation; marine resources management; production of multipurpose tree species; seed dispersal
936-4200	* Project NOAH (Office of Agriculture PD&S Funds)	Agriculture	USAID	25,700	1992-99	111	5	27	1	genetic diversity conservation; genetic research; information dissemination
936-5052	Project Review	Research	R&D/Office of Research	4,267	1984-C	219	46	60	46	scientific information networking; policy research; prioritizing research
936-4111.88	Consultative Group for International Agricultural Research (CGIAR)	International Orgs.	CGIAR	0	1968-C	9,856	23	2,298	6	environmentally sustainable agriculture; genetic research; genetic diversity conservation; soil conservation; climate change research; integrative pest management; policy reform

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project

201

Appendix A: Forest & Biodiversity Conservation Program Project List (FY 1992-93)

FOR USAID INTERNAL USE ONLY

A-202

Project Number	Title ^a	Mission/Office	Primary Implementing Organization(s) ^b	Planned LOP ^c	Years of Obligation ^d	1992 Obligations		1993 Obligations		Activities
						\$ 000's	%	\$ 000's	%	
Other										
936-4053	* Market and Technology Access	Int. Business Staff	InterAmerican Management Consulting Corp. (IMCC)	5,439	1983-92	150	20	0	20	forestry marketing; forestry market research; agribusiness
938-0158	Matching Grants to PVOs	Private/Vol Coop.	World Wildlife Fund; various PVOs	0	1981-C	1,435	8	1,120	8	biodiversity conservation; community-based conservation; information networking; coastal resources mgt; environ. educ.; ecotourism; NGO institutional strengthening; protected areas mgt; buffer zone mgt; environmentally sustainable agriculture; agroforestry
930-0085	Integrated Studies and Systems	PPC	MSI, Inc.; Louis Berger Int'l; Academy for Educational Development; TVT Associates	178	1980-92	0	4	0	0	evaluation of AID supported environmental and forestry activities

* Projects described in this report

^a NPA = Nonproject Assistance
PA = Project Assistance

^b tbd = to be determined

^c LOP = Life-of-Project funding (\$000s)

^d C = Continuing project