

PN-ABL 711

78240

Tropical Forests — A N D — *Biological Diversity*

*USAID Report to
Congress 1990-1991*



*United States Agency
for International
Development*

*Washington, D.C. 20523
May 1992*

To the Congress of the United States:

I am pleased to provide this 1990-1991 report on the United States Agency for International Development's (USAID) program for conserving tropical forests and biological diversity.

Recognition of both the ecological and the economic importance of tropical resources and the haven these habitats provide for a large and varied array of plant and animal species has continued to rise in national-level priorities and in international development programs. Threats to terrestrial, aquatic and marine biodiversity must be dealt with effectively in our lifetimes, if the rich and irreplaceable heritage of life on Earth, with its almost infinite possibilities for the future, is to be sustained and made available for generations to come.

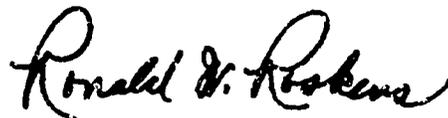
Unprecedented events and actions on the global level, such as the United Nations Conference on Environment and Development (UNCED) in June 1992, in Rio de Janeiro, Brazil, signal a transformation in attitudes toward conservation, sustainable management of natural resources and protection and maintenance of environmental quality. Efforts to develop international conventions on forests and biological diversity, together with international discussions on global climate change convincingly demonstrate the high level of interest in these issues among developed and developing countries alike.

USAID has been vigorously responsive over the past two years to these challenges through development projects in more than 60 countries around the world. By the end of 1991, USAID's commitments to tropical forest conservation, management and protection had more than doubled from their already impressive 1989 levels, while USAID support for biodiversity conservation increased by more than 400 percent during this same period.

USAID provided record levels of support during 1990 and 1991 for conservation assistance work in more than sixty countries. A total of \$295 million during the period funded over 125 projects supporting tropical forests and biological diversity conservation. Agroforestry projects supported in more than twenty countries are contributing to sustaining local agriculture and relieving pressures on nearby parks and reserves. USAID developed active partnerships with indigenous nongovernmental organizations (NGOs) in all regions. In Africa the natural resources work of over 200 NGOs has been strengthened. With USAID support, the World Wildlife Fund and the Philippines conservation community have concluded the largest debt-for-nature swap in Asia.

As USAID continues to work with its governmental and nongovernmental partners to assist nations to conserve their tropical forests and biological resources, the continued commitment of the Congress and the American people will remain essential.

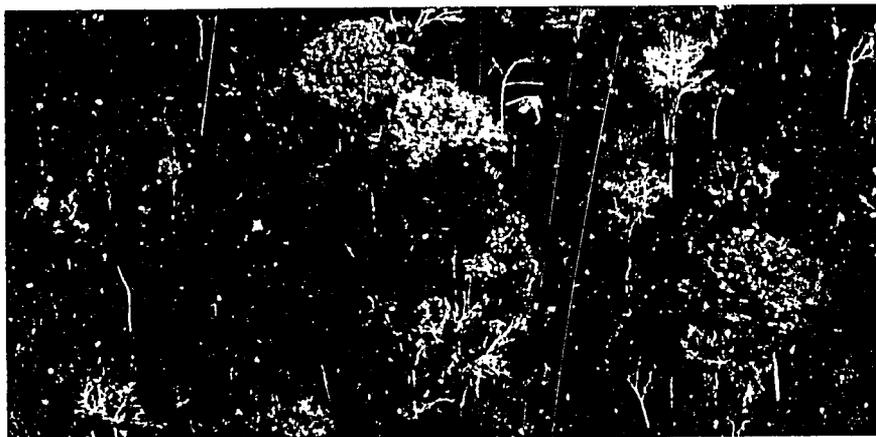
Sincerely,



Ronald W. Roskens
Administrator
U.S. Agency for International Development
May 1992

Highlights—1990-1991

USAID Tropical Forest and Biological Diversity Conservation



Conserving Biodiversity

USAID:

- Backed implementation by a *World Wildlife Fund-led consortium* of more than 100 activities—focused largely on conserving biodiversity in tropical forest ecosystems—through more than 50 institutions in 60 countries. (See p. 23)
- Supported *African elephant conservation* through new projects in Niger, Cameroon and Tanzania and ongoing projects in Botswana, Zambia, and Zimbabwe. (See p. 30)
- Advanced *ex-situ preservation* of genetic material through support to the International Maize and Wheat Improvement Center and the University of California's Genetic Resources Conservation Program. (See p. 12)
- Improved the conservation of unique coral and other *coastal ecosystems* in Ecuador, Sri Lanka, and Thailand. (See p. 27)

- Backed research on biological diversity in different ecosystems around the world through collaboration with the National Science Foundation. (See p. 14)

Supporting Protected Areas

USAID:

- Supported *better on-site management* for critically threatened tropical ecosystems of global importance in Latin America and the Caribbean. (See p. 42)
- Backed efforts to protect millions of acres of *tropical forest ecosystems* in Belize, Guatemala, and Mexico, which together constitute one of the largest and richest remaining tropical forest complexes in Central America. (See p. 16)

Sustainable Forestry and Forest Conservation

USAID:

- Funded nearly 100 projects around the world that supported *conservation or management of tropical forests*, agroforestry, reforestation, and watershed management—as well as related aspects in policy, planning, and institutional strengthening. (See p. 11)
- Supported *agroforestry* research and extension through 28 projects worldwide. (See p. 17)

- Participated in seven country-level *Forestry Sector Reviews* and is leading the coordination for the reviews for Central America and Guatemala. (See p. 8)
- Launched a new effort aimed to curtail logging in the Philippines' remaining *primary forests*, while developing and implementing management plans for other natural forests in the nation. (See p. 36)
- Helped develop a framework in the Philippines to use *private* contractors for *reforestation*—a major innovation in a nation where reforestation on public land has been a government activity. (See p. 36)

Strengthening Nongovernmental Organizations (NGOs)

USAID:

- Increased the institutional capacity of some 200 *African NGOs* to develop and implement natural resource projects. (See p. 30)
- Joined forces with the World Wildlife Fund and the Philippine conservation community in 1991 to conclude the largest *debt-for-nature swap* in Asia. Proceeds will fund a Filipino conservation foundation. (See p. 36)
- Supported active partnerships with *indigenous NGOs* in all regions through USAID projects that support biodiversity conservation, agroforestry, park protection and management, and watershed conservation.

Record Funding Levels

USAID:

- Supported *record levels of funding* for projects devoted to *tropical forest conservation and management*—\$109 million in 1990 and \$125 million in 1991. (See p. 11)
- Committed \$53 million in 1990 and a record \$72 million in 1991 for funding for projects devoted to *biodiversity conservation*. (See p. 12)
- Dramatically increased funding for *activities that combine conservation of tropical forests and biodiversity*. Such funding within more than 20 projects jumped from \$5.1 million in 1989 to \$29 million in 1990 and \$35 million in 1991. (See p. 12)



Table of Contents

Introduction	8
USAID: From Commitment to Action	11
Funding trends	11
Recent USAID initiatives	12
Focus on USAID forestry assistance	18
Centrally Funded Programs	21
The Forest Resources Management Project	21
The Biodiversity Support Program	23
The Development Strategies for Fragile Lands Project	26
The Coastal Resources Management Project	26
USAID's Activities in Africa	29
The Natural Resources Management Support Project	29
Senegal: The Reforestation Project	31
Madagascar: Protecting biological diversity	31
Kenya: Safeguarding wildlife	32
USAID's Activities in Asia	35
Recent USAID Initiatives—Indonesia, Nepal, South Pacific	35
Ongoing USAID Activities—Nepal, Thailand, Indonesia, Pakistan ..	37
USAID's Activities in Latin America and the Caribbean	41
Recent USAID Initiatives—Environmental Support Project, E. Caribbean, Nicaragua, Panama, Guatemala, Ecuador	43
Ongoing USAID Activities—Central America, Costa Rica, Honduras	46
Annex: USAID development projects referenced in this Report to Congress	49
Special Topic Summaries	
Legislative mandates	13
Country level assessments	14
The Global Environment Facility	16
Highlight on USAID agroforestry activities	17
Protecting biodiversity in Niger	22
Conserving Central America's natural resources	23
Focus on African elephants	30
Monitoring the impacts of USAID activities	33
Focus on the Philippines	36
Protecting parks in peril	42
Conserving neotropical migratory birds	45



*Rainforests house
more than one-half of
Earth's plants and
animals.*

Mark Edwards, Still Pictures

Introduction

The world's irreplaceable natural heritage is being destroyed at an unprecedented rate. Plants and animals are being threatened with extinction at a speed and on a scale never seen before in human history. Much of this loss is occurring in tropical forests, which house more than one-half of the at least five million species of plants and animals thought to exist on Earth.¹ As many as one-fourth of tropical forest species could face extinction within the next 50 years if forests continue to be degraded or converted to other uses at current rates. Worldwide, about half the planet's primary tropical forests already have been removed. Meanwhile, an area four times the size of Switzerland—some 17 million hectares—is being lost each year, according to the most recent assessments by the U.N. Food and Agriculture Organization (FAO).

This loss of habitat and species threatens ecological stability, economic development, and human welfare. Effectively conserving biological diversity requires a major shift in thinking at all levels of policy making—from local to national—and a strong and concerted international effort.

This Report to Congress focuses on the efforts of the U.S. Agency for International Development (USAID) to protect and conserve tropical forests and biological diversity. The reporting period is U.S. Government

Fiscal Years 1990 and 1991, and the endeavors described reflect the significant achievements of USAID in light of the increasing international importance assigned to the environment and sustainable natural resource management.

In the next section of this introduction, the unprecedented problems posed by loss of tropical forests and biological diversity are discussed. The box that follows describes the international response to these problems and discusses multilateral, collaborative activities around the world that USAID supports. The report then describes USAID's own significant programs to protect and conserve tropical forestry and biological diversity.

An Urgent and Growing Problem

Evidence is clear and mounting that the fate of most of the Earth's "ark" of wild species is linked to the fate of tropical forests—especially rainforests, as well as other ecosystems. Important values and benefits lie in the balance:

Ecological stability. Loss of tropical forests—the world's "lungs"—increases carbon dioxide in the atmosphere and may contribute to global climate change. Destruction of forests impairs the ability of land to maintain life; the result can be soil erosion, flooding, and diminished capacity to produce food. Meanwhile, tropical aquatic systems are being lost as fast as—if not faster than—tropical terrestrial systems.

Human health. One-fourth of medical prescriptions dispensed in the United States contain active ingredients first extracted from plants. World-

wide, commerce in medicines from the wild generates around \$40 billion per year; in the United States alone, medicines from wild plants are valued at \$14 billion annually. Species now disappearing could help treat or prevent many of today's diseases, as well as illnesses that may become commonplace in the future.

Effectively conserving biological diversity requires a major shift in thinking at all levels of policy making . . . and a strong and concerted international effort.

Moreover, four out of five people in the developing world depend on traditional medicines made from plant species. Yet many of these species are now endangered.

Food production. Some 80,000 edible plant species are thought to exist, but only a few hundred have ever been cultivated; a mere 12—including corn, rice, and wheat—have emerged as important staples. The unchecked loss of species could impair future food supplies.

Moreover, to protect against disease and pests, domestic varieties of crops need to be interbred with wild strains. For example, in the 1960s, when an epidemic of wheat disease—stripe rust—struck the United States, causing Montana to lose one-third of its harvest for several years, genes from a strain of wild wheat from Turkey provided the resistance to stripe rust and a number of other diseases needed to prevent further losses and safeguard future harvests.

¹ Other estimates place the world's biological wealth at 50 million to 500 million species. Only 17 million of these species have been identified.



Economic consequences. Losses to the agricultural industry alone could be great. Plant breeding in the United States was responsible for fully half the gains in yield in the nation's agriculture from 1930 to 1980. The widened genetic base has added some \$1 billion to the value of U.S. agricultural output each year. What will happen to such gains when wild species have been driven to extinction?

Many factors contribute to the degradation and conversion of tropical forests and the loss of the world's biological diversity. These include population growth, poverty, unrestrained human consumption, misguided policies, and inequities in land and resource tenure. The expansion of cropland, resulting from the continuing quest for new areas to cultivate, occurs largely at the expense of tropical forests. Some 1.17 million square kilometers of forests—an area the size of Bolivia—fell to croplands between 1971 and 1986, and the rate of conversion of forests to cropland is accelerating.

The challenge in the years ahead is to ensure that the biological riches of tropical forests and other ecosystems are sustained in the process of economic growth.

The Global Response

Much valuable work is being done by the international community on the national, regional, and global levels to protect tropical forests and conserve biological diversity. USAID supports these worldwide efforts—both through its own programs, and by collaborating with other international activities. These include work with:

Developing country governments. Close cooperation with developing country governments is an integral part of USAID's work. For instance, in addition to the many country-wide projects described later in this report, USAID has participated in seven country-level Forestry Sector Reviews (FSRs) and is leading the coordination for the reviews for Central America and Guatemala.

Domestic and international non-government organizations (NGOs) and private voluntary organizations (PVOs). Such groups are strong cooperators in carrying out many aspects of USAID's environmental work. These include such groups as CARE, The Nature Conservancy, the Pan American Development Foundation, the World Conservation Union (IUCN), the African Wildlife Foundation, the World Resources Institute (WRI), and the World Wildlife Fund (WWF-U.S.). In addition, universities, foundations, institutes, botanical gardens, and many other organizations participate in USAID's environment work.

USAID has worked to strengthen PVOs and NGOs in the developing world. For instance, the PVO/NGO Strengthening Project—a cooperative agreement with the Experiment in International Living, CARE, and the World Wildlife Fund—has increased the institutional capacity of some 200 African NGOs to develop and implement natural resources projects.

Other bilateral and regional assistance programs. USAID also works closely with other bilateral and regional

dondrs. For instance, USAID's initiative to protect habitats for important populations of African forest elephants will complement an effort by the European Community, the Conservation and Rational Utilization of Forested Ecosystems in Central Africa Program. (See p. 30)

Multilateral development banks (MDBs). USAID coordinates closely with the MDBs, such as the World Bank. For instance, at the request of Congress, USAID has taken an active role in encouraging greater environmental sensitivity by the multilateral development banks—particularly the World Bank—in project selection and design. USAID continues to hold regular meetings under its Early Warning System with representatives of environmental NGOs, the U.S. Treasury and State departments, and the U.S. Environmental Protection Agency to analyze potential environmental impacts of projects being designed by those banks. The process has contributed to a steady improvement in the performance of most MDBs.

Other international organizations. USAID cooperates with other worldwide bodies, including the United Nations organizations, such as the FAO, the U.N. Development Programme (UNDP) and the U.N. Environment Programme (UNEP). For example, USAID is working with UNDP, UNEP, and the World Bank in the Global Environment Facility, a three-year pilot facility of more than \$1 billion that will address global environmental issues. (See box, p. 16)

Of particular note are efforts that have coordinated action regarding the management of forestry, the environment, and natural resources in development countries. These include:

Environmental action plans. These guide a nation's development and protection of the environment. Plans are

devised by developing countries themselves, often in consultation with multi-lateral development banks, international and other regional organizations, PVOs, NGOs, and bilateral donors such as USAID.

For example, USAID has worked closely with the World Bank on Madagascar's National Environmental Action Plan. USAID has taken the lead in backing programs to establish sustainable human and natural ecosystems in areas of Madagascar where biological diversity is threatened and in helping advance reforms to address key constraints that limit sustainable growth. (See p. 32)

The Tropical Forestry Action Plan (TFAP). This plan has attempted to offer a global platform to encourage sustainable management of tropical forests. However, it needs reform, and USAID supports current international efforts to reform TFAP, particularly through a consultative forum.

The Consultative Group for International Agricultural Research (CGIAR). This worldwide research system is moving to include forestry research within its mandate and will be helping to build the future base of knowledge on tropical forest management and conservation, agroforestry, and related systems. USAID is supporting the formation of the International Center for Forestry Research and the work of the International Council for Research in Agroforestry (ICRAF).

In addition, the Agency is contributing to forestry and biological diversity conservation activities in other CGIAR centers. For example, through the Mexico-based International Maize and Wheat Improvement Center (CIMMYT), USAID is helping the first coordinated, multinational effort to preserve the original genetic stocks of maize. This program will serve as a model for future efforts to coordinate regeneration of other crops and animals. (See p. 12)

The International Tropical Timber Organization (ITTO). This organization focuses on sustainably using and conserving tropical forest resources; expanding and diversifying markets for and capacities of wood-based industries; and promoting environmental protection and conserving genetic resources. USAID is cooperating with the Department of State on matters related to the ITTO.

The Intergovernmental Panel on Climate Change (IPCC). Among other initiatives, the panel is promoting and helping to plan appropriate actions by nations and international bodies to deal with greenhouse gas emissions that may spur climate change.

Global Agreements

A number of international environmental agreements are in various stages of development. The United Nations Conference on Environment and Development (UNCED), to be held in Brazil in June 1992, has focused world efforts on several of these agreements. USAID is participating in consultations and helping the Department of State shape these conventions.

A Global Biodiversity Strategy, to be presented at UNCED, aims to develop a compendium of information about critical species and their threatened ecosystems; improve conservation policies; and expand action programs to safeguard biodiversity. The strategy will provide guidelines and concrete recommendations for actions to save, study, and sustainably manage the Earth's wealth of species and their habitats. This initiative has been under preparation since 1989 as a key component of the Biodiversity Strategy Program, organized by the World Resources Institute, the World Conservation Union (IUCN), and UNEP. USAID is one of more than 40 governmental and non-governmental organizations involved in the effort.

A Global Forest Convention also will be discussed at UNCED. President Bush

proposed the convention at the Houston Economic Summit in 1990 and called for it to be ready to be signed at UNCED. While that timetable proved to be optimistic, participating countries plan to have an "authoritative set of principles" ready for UNCED, which would provide the basis for subsequent deliberations.

Other Worldwide Efforts

Protected areas. Among the most effective mechanisms currently available to conserve biodiversity is direct *in situ* conservation and protection. To date, more than 130 nations have established some 6,900 major, legally protected areas, covering almost five percent of the planet's land surface. Since 1972, the total number of protected areas has almost doubled; the area under protection has increased by more than 60 percent.

USAID has backed efforts around the world to expand and better manage protected areas. The Parks in Peril Project is improving on-site management in numerous critically threatened ecosystems of global biological importance in protected areas in Latin America and the Caribbean. (See p. 42) The Agency also is supporting improved management of protected areas in Africa and Asia. (See pp. 30 and 37)

Monitoring systems. These systems contribute to the worldwide pool of knowledge on tropical forests and biological diversity. Many such systems are already in place or are planned. A Global Information System and Early Warning System on Plant and Animal Genetic Resources is being developed to provide a practical inventory of genetic resources and information on the potential hazards that threaten species with extinction. FAO and the International Board for Plant Genetic Resources (IBPGR) are the developers of this system, which will rely in part on IBPGR's databases. USAID provided a total of \$2.1 million to IBPGR during 1990 and 1991, which is approximately 15 percent of IBPGR's core funding.



USAID: From Commitment to Action

Conserving biological diversity and tropical forests and promoting sustainable forest management are among USAID's top priorities. In 1990 and 1991, the Agency continued to translate that commitment into action.

Policies and strategies. USAID further evolved both its policy guidance and strategies in 1990 and 1991. In May 1990, the Agency approved a major statement of mission, the Environmental Initiative, which targeted conservation of tropical forests and biological diversity for high attention in Africa, Asia, Latin America, and the Caribbean. In response to the new Environmental Initiative, USAID's regional bureaus undertook program planning within an Agency-wide effort to develop an environmental strategy. This planning work culminated in the definition of an Environmental Framework in December 1991 that sets an overall approach for a worldwide program and lays the groundwork for regional strategies that are to be developed within the framework by each of USAID's geographic bureaus in Africa, Asia, Latin America and the Caribbean, the Near East, and Europe.

As USAID's regional and central bureaus have devoted increasing resources toward project activity related to tropical forests and biological diversity conservation, the bureaus have continued to work with the various internal plans noted in the last report to Congress. In particular, the Agency and its bureaus have been guided by three documents: the 1988 Policy on Environment and Natural

Resources; the Bureau for Africa's Plan for Supporting Natural Resources Management in Sub-Saharan Africa; and a similar strategy paper for Central America.

Projects. During 1990 and 1991, USAID projects began to reflect the strategic approaches—including greater attention to policy issues—articulated in the Environmental Initiative for addressing tropical deforestation, the loss of biological diversity, and other critical environmental problems. Projects increasingly incorporated three approaches to promoting environmentally sound development: reforming policy; strengthening institutions and human capacity; and encouraging private sector participation. Many USAID projects that deal with tropical deforestation and biological diversity loss now include policy reforms, along with steps to strengthen institutions and build human capacity, including efforts to foster public awareness of environmental issues. Moreover, numerous projects in all the regions in 1990 and 1991 employed private sector activity that supports conservation, such as ecotourism. In addition, nongovernmental organizations (NGOs) increasingly carried out project activities. Through numerous grants, collaborative agreements, and other mechanisms, the Agency supported local indigenous NGOs in their work in forestry, agroforestry, and biological diversity conservation.

Funding Trends

A dramatic increase in total funding obligations for both forestry and biological diversity conservation occurred in 1990. Moreover, obligation levels remained high in 1991. In all, annual obligation levels have more than doubled since the last

report to Congress covering 1988 and 1989. That report noted numerous projects in the planning stages: 23 forestry projects and 29 biodiversity conservation projects were being planned at the end of 1989. Many of these projects were larger than earlier ones. Thus, although the total number of projects receiving funding remained approximately the same from 1988 to 1991, total funding commitments increased greatly.

Many USAID projects that deal with tropical deforestation and biological diversity loss now include policy reforms, along with steps to strengthen institutions and build human capacity.

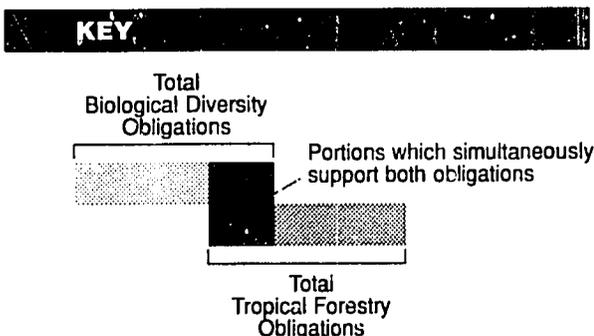
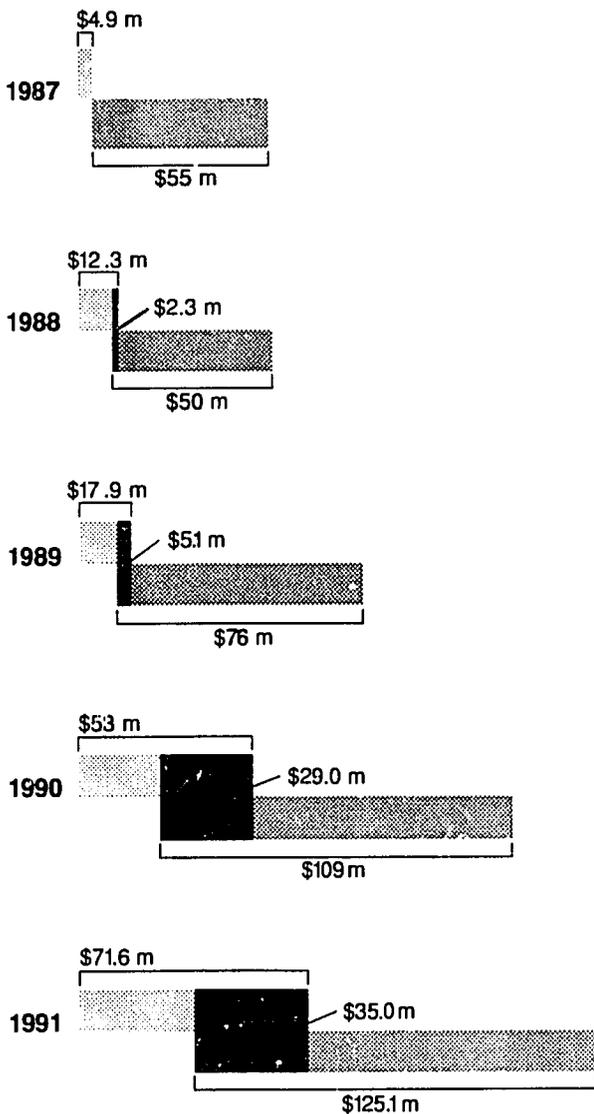
By the end of 1991, USAID had committed funding to 88 projects that supported conservation of tropical forests and 57 projects that supported biological diversity. Some of these projects—24 projects in both years—supported both biological diversity and tropical forest conservation. Since 1989, the numbers of active and planned projects have declined slightly. However, this trend has been offset by the larger scale of projects during that period.

Funding trends for forestry. Compared to previous levels, funding for tropical forest conservation and management continued to increase in 1990 and 1991, reaching a record level of \$125 million in 1991 in obligations distributed among 88 different projects. Some \$36 million of this 1991 total also supported biodiversity conservation. At the close of FY 1991, 12 projects with forestry activities were planned for start-up in 1992.

Conserving Tropical Forests and Biological Diversity: 1988-1989; Report to Congress on the USAID Program (Washington D.C., USAID, 1990).

Tropical Forest Conservation and Biological Diversity Conservation

Obligations for Fiscal Years 1987-1991



1990 figures are adjusted from previous estimates.

Funding trends for biological diversity conservation. A dramatic increase in funding for the conservation of biological diversity has taken place since 1989. Funding grew from \$4.9 million in 1987 to \$12.3 million in 1988, \$17.9 million in 1989, \$53 million in 1990, and \$72 million in 1991. Funding increased markedly from 1989 to 1991—although the number of projects remained nearly the same. Most of the increase resulted from a greater number of large-scale dual-purpose projects that conserve both tropical forests and biological diversity. At the close of FY 1991, nine projects with biodiversity conservation activities were planned for start-up in 1992.

Increase in multiple-purpose projects. 1990 and 1991 marked a large increase in funding for natural resources management projects that combine support for tropical forests and biological diversity conservation. Moreover, funding that simultaneously supports both objectives increased substantially in other types of projects. A notable example is the Parks in Peril project, which supports the management and protection of parks with extensive forest ecosystems in Latin America and the Caribbean. (See box, p. 12) Worldwide, 21 projects in 1990 and 1991 supported the twin objectives of tropical forest and biological diversity conservation. Funding for activities that simultaneously achieved these two objectives totaled \$29 million in 1990 and \$35 million in 1991—a ninefold increase from 1989.

Recent USAID Initiatives

USAID has developed a number of new initiatives in the area of tropical forestry and biological diversity in 1990-1991:

Project Noah: *Ex situ* conservation of biological diversity. The Agency is supporting an innovative project to stimulate concern for the

loss of the world's diversity and promote technologies necessary to advance the *ex situ* preservation of genetic material. The effort, originally envisioned by Congress as an "international rescue mission for the thousands of animal and plant species faced with the prospect of eminent extinction", is named "Project Noah" in reference to the biblical story of Noah—the earliest recorded example of *ex situ* conservation.

In 1990, Congress requested that USAID study the need for *ex situ* conservation of biological diversity and identify programs that require support through Agency assistance. The Agency's Bureau for Research and Development responded to the Congressional request by preparing a report to Congress entitled "*Ex Situ* Conservation: Present Status and Future Priorities". Based upon recommendations in this report, Congress authorized USAID to initiate preservation activities and obligate \$750,000 in FY 1991.

A number of new initiatives already have resulted:

- USAID provided a grant to the International Maize and Wheat Improvement Center (CIMMYT) to begin the first coordinated, multinational effort to regenerate and save the ancestral primitive and landrace genetic stocks of maize. This program will involve collaborative efforts with 13 Latin American and Caribbean countries and will serve as a model for future efforts to coordinate regeneration in other crops and animals.

CIMMYT, based in Mexico, will serve as the central organizational body and will coordinate accessions with other Latin American genebanks, as well as with the National Seed Storage Laboratory of the U.S. National Plant Germplasm System. A priority listing of accessions to regenerate has already been developed.

U.S. Legislative Mandates on Tropical Forests and Biodiversity Conservation

U.S. policy concerning tropical forests and biological diversity is shaped by the legislative framework of the Foreign Assistance Act of 1961, as amended (FAA). A 1977 amendment to the FAA gave the President authority to enhance the capabilities of developing countries to assess the environmental consequences of development programs and to better manage natural resources. Deforestation was part of the focus of the 1978 FAA amendments, as was the need to place more attention on the environment and natural resources as the basis for sustainable growth. In 1979, Congress amended the FAA to give the Agency a more specific mandate (Section 103(b)(3)) for carrying out forestry assistance, with special emphasis on "community woodlots, agroforestry, protection of watershed forests, and more effective forest management".

In the 1980s, Congressional action on issues related to tropical deforestation and other environmental issues intensified. In 1981, an amendment to Section 118 (currently Section 117) of the FAA required environmental assessments of any USAID project that would significantly affect the environment. This action essentially adopted USAID environmental procedures already in use. In 1983, Congress added Section 119, which regulated hunting, trade in, and protection of endangered species. In 1986, Congress amended the FAA by adding a new section specifically to address tropical deforestation (new Section 118) and Section 119 was amended to encourage the participation of local people in design and implementation of projects related to biological diversity, as well as requiring USAID to undertake certain actions to protect ecosystems and preserve biological diversity in its bilateral foreign assistance programs.

Congress then established the Development Fund for Africa, which became operational in FY 1988, and directed USAID to carry out specific ac-

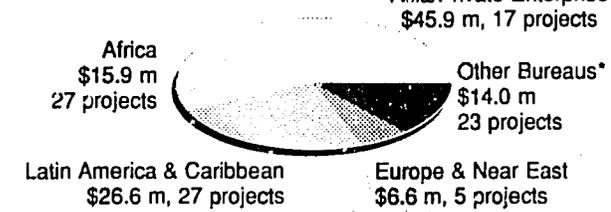
tions in Africa concerning sustainable agricultural production and the maintenance of the natural resource base to assure sustainable production and economic growth.

In the FY 1990 Foreign Assistance Appropriations Act (P.L. 101-187), Congress required USAID to provide guidance to its bureaus and missions detailing the elements of a "Global Warming Initiative" which would "emphasize the need to reduce emissions of greenhouse gases...through strategies consistent with [the recipient country's] continued economic development." The initiative emphasized reforestation, biodiversity, end-use energy efficiency, least-cost energy planning, and renewable energy. More specifically, Congress directed USAID to focus its tropical forestry assistance and energy assistance on "key middle- and low-income developing countries" which were projected to contribute large amounts of greenhouse gases related to global warming. USAID subsequently identified the "key" countries in a report to Congress as Brazil, India, Indonesia, Mexico, the Philippines, and Poland, and the regions of Central America and the Congo Basin.

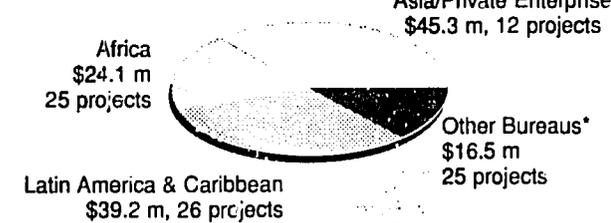
In the FY 1991 Foreign Assistance Appropriations Act (P.L. 101-513), Congress prohibited USAID from supporting activities that would result in any significant loss of tropical forests or involve commercial timber extraction in primary tropical forest areas. In April 1991, in the Dire Emergency Supplemental Appropriations Act of 1991 (P.L. 102-27), Congress clarified the prohibition by amending the provision to permit commercial logging activities in USAID projects as long as an environmental assessment is conducted that identifies potential impacts to biological diversity; demonstrates that all timber extraction will be environmentally sound; and demonstrates that the activity will contribute to reducing deforestation.

Obligations and Activities Supporting Tropical Forestry

FY 1990
\$109 million, 99 projects

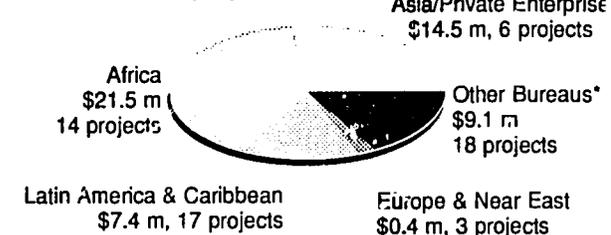


FY 1991
\$125 million, 88 projects

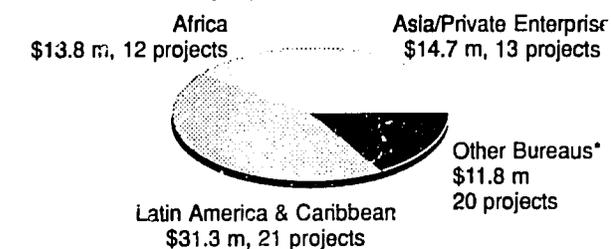


Obligations and Activities Supporting Biological Diversity

FY 1990
\$53 million, 58 projects



FY 1991
\$71.6 million, 66 projects



* Other Bureaus: Food for Peace, Voluntary Assistance, Program and Policy Coordination, and Science and Technology

Assessments of Biodiversity and Forest Resources

USAID continues to employ a key tool to conserve biological diversity and forestry resources: assessments of those resources. The 1986 amendments to the Foreign Assistance Act (FAA) called upon USAID missions to include such assessments in country or regional development plans and strategies, and to identify actions necessary to conserve biological diversity and tropical forests. (These assessments are called "118-119 assessments", after Section 118 in the Foreign Assistance Act, which deals with tropical forestry, and Section 119, which addresses biological diversity. For more on the FAA, see box, p. 13)

In 1990 and 1991, USAID missions continued to carry out assessments of biodiversity and forest resources. In the Asia and Near East region, USAID missions in 10 countries—Bangladesh, Burma, Egypt, Indonesia, Morocco, the Philippines, Sri Lanka, Tunisia, Turkey, and Yemen—have completed formal biodiversity assessments. USAID/Thailand supported the development of an environmental and natural resources assessment, while USAID/Nepal and USAID/Jordan assisted those countries in developing national conservation strategies. USAID/South Pacific has helped develop a nature conservancy data bank in Samoa. In Papua New Guinea, USAID is currently helping conduct a conservation needs assessment.

In 1990-1991, the Bureau for Africa supported the development of African elephant conservation needs assessments and action plans for 14 countries: Angola, the Central African Republic, Côte d'Ivoire, Equatorial Guinea, Guinea, Guinea Bissau, Malawi, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Zaire, and Zambia. USAID/Cameroon completed a natural resource management assessment for the country; primary components focused on biological diversity and tropical forests.

In the Latin America and Caribbean region, "118-119 assessments" have been carried out in all major client countries and a process of updating the original assessments in several countries is under way.

With assistance from USAID and other sources, the World Resources Institute is now regularly publishing a directory of country environmental studies, which includes brief summaries of USAID's country assessments.

- USAID also made a grant to the Genetic Resources Conservation Program at the University of California to develop a course that combines plant and animal *ex situ* conservation. At least 26 participants from developing countries sponsored by USAID will attend the course. Faculty will be drawn from the staff of the San Diego Zoo, the U.S. National Plant Germplasm System, the University of California, and other U.S. universities.

Such 1990 and 1991 initiatives are helping to strengthen and expand international and domestic efforts to build an integrated, comprehensive program in *ex situ* conservation.

Collaboration with the National Science Foundation (NSF). To expand knowledge of potential threats to ecosystems and species in developing countries, USAID and NSF have entered into a collaborative research program. USAID provided \$989,000 in FY 1990 for the program through an interagency agreement with NSF. The projects funded by the two agencies will help strengthen programs and facilities for biodiversity research and education and will promote productive working relationships between U.S. and foreign scientists.

With the funds awarded in FY 1990, U.S. researchers led studies in Brazil, Colombia, Costa Rica, Indonesia, Mexico, Nicaragua, the Philippines, and Thailand. The first 12 projects under way include studies of ecosystems, individual species, and the impact of continuing development on land-use trends.

Collaboration was strengthened further in FY 1991 when USAID provided \$1.5 million in additional funding. NSF matches these funds on a two-to-one or three-to-one basis.

Focus on Global Climate Change

The threat of climate change is increasing international concern and action. Worldwide changes in climate may be caused in part by human activities, such as the burning of fossil fuels for energy consumption, deforestation and forest burning, changing agricultural practices, industrialization, urbanization, and waste disposal. These activities increase the concentration of "greenhouse gases" in the atmosphere—particularly carbon dioxide, chlorofluorocarbons (CFCs), methane, and nitrous oxide.

These gases retain heat reflected from the Earth's surface; as less heat is lost to space, the Earth's average surface temperature may be rising. The result may be increases in the atmosphere's temperature and, in some areas, more extreme weather, including more frequent storms, intense rains, and droughts. Although the magnitude and impact of such changes are not yet clear, their potential threat has led many countries to plan or implement actions to reduce the emission of greenhouse gases to reduce future climate change.

The United States has joined other nations in responding to the threat of global climate change. National efforts have coincided with U.S. action at the international level. (See box on the Global Environment Facility, p. 16). In FY 1990, Congress directed USAID to implement a global warming initiative and to provide \$15 million specifically to "combat the global warming phenomenon and the long-term threat that emissions of greenhouse gases pose to the entire world". This funding target was doubled to \$30 million for FY 1991. In addition, Congress targeted another \$20 million to provide assistance and training to promote end-use energy efficiency and renewable energy resources in "key" middle- and low-income developing countries and regions that contribute significantly to global greenhouse gas

emissions, such as Brazil, Central America, India, Indonesia, Mexico, the Philippines, and Poland.

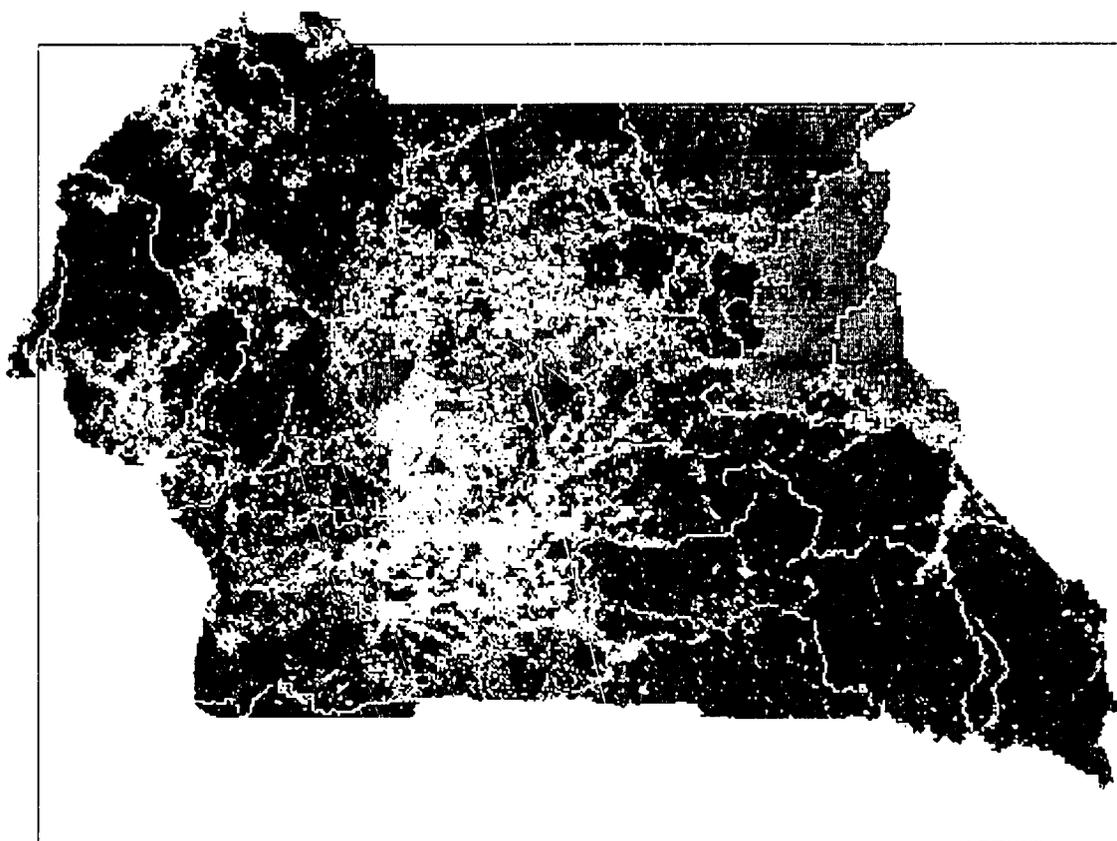
USAID is one of the most active U.S. government agencies funding activities in developing countries that address climate change. USAID's objective is to mitigate to the extent possible the threat of global climate change by helping nations to reduce emissions of greenhouse gases and increase sinks or storage capacity of such gases. The Agency's strategy to address the global climate change challenge is presented in the June 1991 report *Global Climate Change: Guidelines for USAID Missions and Bureaus*. Highlights of the Agency's efforts to address global climate change in selected regions follow.

Africa. Central Africa contains Africa's largest remaining tracts of humid tropical forest. The Congo Basin has the greatest vegetation-related carbon inventory of any region in Africa; the Basin is the greatest potential contributor to global climate change through possible future forest burning and deforestation. The Basin's six countries—Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, and Zaire—account for approximately half of Africa's potential vegetation-related emissions of climate changing gases.

In the region, USAID has varied objectives: to assess the extent of forested area in the Basin; to determine the extent of biomass burning in the region's tropical forests and savannah areas; and to prepare an action plan for the Basin.

The Congo Basin Action Plan will provide the Agency with alternatives for future policies and development activities. The plan will examine current and proposed activities and present a coordinated approach for the conservation and development of the region's forests.

In 1990, the Agency initiated a general inventory of the extent and status of the forest area in the six coun-



tries. The preliminary data base for future activities was drawn from satellite imagery acquired and analyzed by NASA as part of the action plan.

The Congo Basin Action Plan also will review management alternatives. The USAID mission in Cameroon conducted a natural resources management assessment in that country in 1991 that focused on opportunities for USAID support in tropical forest conservation and management.

USAID also provided \$500,000 in FY 1991 for initial efforts in the Congo to support the protection of a contiguous forest area shared by Cameroon, the Central African Republic and the Congo.

The World Wildlife Fund, Wildlife Conservation International and the Experiment in International Living cooperated in planning studies for this forested area, which has been proposed as a tri-national park. It would be the largest managed tropical forest area in Africa and would also provide habitat for important

populations of African forest elephants

This USAID support is complementary to that of other donors in the region, including a European Economic Community program, Conservation and Rational Utilization of Forested Ecosystems in Central Africa.

Latin America and the Caribbean.

In the region, USAID emphasizes alternative practices and policies to reduce the emission of greenhouse gases, while promoting economic development consistent with the national goals of the countries involved. The Agency promotes sustainable agroforestry and improvement of degraded pastures to reduce pressure on forests. In addition, USAID encourages policy analysis, training in natural resource economics, and strengthening of local NGOs and relevant government agencies.

Specifically to address the problems of global climate change, USAID's Bureau for Latin America and the Caribbean initiated a four-year,

Satellite imager analysis of southern Cameroon. Light gray is degraded forest.

The Global Environment Facility

In recent years, the international community has begun to respond forcefully to the threat of global climate change. An example is the creation of the Global Environment Facility (GEF), a three-year pilot program designed to provide grants to developing countries to help them carry out programs to relieve pressures on global ecosystems. The trust fund of more than \$1 billion approved in March 1991 is intended to support activities in four interrelated areas: biodiversity; ozone depletion; pollution of international waters; and global climate change (including energy efficiency and conservation, as well as tropical forest conservation).

The facility is a cooperative venture bringing together the World Bank, UNDP, UNEP, and national governments. Many governance issues relating to GEF in the long term remain to be worked out. At present, UNDP coordinates and manages execution of pre-investment and technical assistance activities, including project identification, communication with recipient governments, and in-country donor coordination. UNEP provides scientific and technological guidance in identifying and selecting projects and coordinates research and data collection. A Scientific and Technical Advisory Panel (STAP) convened by UNEP gives advice on broad scientific and technical issues.

The United States is committed to ensuring GEF's success and has pledged \$150 million in support in the form of grant-based, parallel financing during the facility's initial three years.

\$27 million project that will focus mainly on Brazil and Mexico. The Environment, Global Climate Change (E/GCC) Project is described below.

This Project aims to promote policy reforms, technologies, and practices that will result in the sustainable use and efficient conservation of forest and energy resources in the region.

In Brazil, E/GCC project-funded activities aim at addressing deforestation through park and extractive reserve management, ecotourism, environmental education, and natural forest management. Six grants

were awarded in 1990: four to the World Wildlife Fund; one to the University of Florida at Gainesville; and one for a cooperative effort to establish an Energy Efficiency Institute.

In Mexico, the project supports protected forest, extractive reserves, and buffer zone management, including research and community-based demonstration activities. For example:

In 1990, the E/GCC project provided support to protect natural areas in Mexico and neighboring Belize and Guatemala, which together constitute one of the largest (5 million acres) and richest tropical forest complexes in the Americas. In Mexico, the project backed efforts to consolidate and manage the Calakmul Biosphere Reserve. Calakmul is of great national and international importance because of its large expanse of tropical forests (nearly 1.8 million acres), the unique biological diversity existing within its boundaries, and its locale contiguous with protected areas in Belize (the Rio Bravo Reserve) and Guatemala (the Maya Biosphere Reserve).

A 1990 grant to Conservation International's Mexico chapter will help consolidate and manage the 800,000-acre Montes Azules Biosphere Reserve, which lies in the heart of the Lacandonia forest, the largest tract of lowland tropical evergreen forest in Mexico. The reserve constitutes the "core protected area" of the forest and has come under increasing pressure in recent years from logging, hunting, slash-and-burn agriculture, road building, oil exploration, and land clearing for grazing.

The E/GCC project also is supporting the management of other protected areas within the region. For example for eastern Paraguay, a \$500,000 matching grant was provided to The Nature Conservancy in

1991 to support the purchase, establishment, and long-term protection of the Mbaracayu Nature Reserve. The Mbaracayu tract is covered by virgin forest of rich biodiversity, the last large stand of dense sub-tropical forest under single ownership in South America. The 225-square-mile reserve was sold to The Nature Conservancy for \$2 million by the World Bank's International Finance Corporation, which held title to the property because of the default of the previous owner, a lumber company. The Nature Conservancy will establish Mbaracayu as a managed nature reserve and endow a management trust fund for its long-term management and protection.

Financing for the procurement and establishment of Mbaracayu also comes from Applied Energy Systems, a U.S.-based corporation, as part of its commitment to offset the global impact of carbon dioxide emissions from its coal-fired plants. The company plans to donate up to \$2 million toward this purchase.

Mbaracayu provides the ancestral home and sanctuary for the native Ache people, who have been in contact with the outside world only since 1976. To protect their rights, the Ache will have a permanent seat on the reserve's management committee and will continue traditional use of the land.

The Biodiversity Support Program. USAID also addresses global climate change through the Biodiversity Support Program (See p. 23), including the following 1990-1991 activities:

The 1990 Pilot Demonstration Project examines the production of carbon dioxide in tropical regions in Africa and the Brazilian Amazon. As part of this project, a U.S.-based NGO, Cultural Survival, will prepare a report for USAID on opportunities to fund local activities that could generate income, while complementing strategies to halt environmental

degradation in the greater Amazon Basin.

For the Brazilian Amazon, the World Wildlife Fund will establish forest management demonstration projects for local companies and communities to reduce the rate of deforestation. This effort will lead to the development of a sustainable timber management plan that will be implemented by a local private sawmill; the development and implementation of several community-based forest management demonstration projects; and the establishment of a working group of scientists, government officials, and industry representatives to make recommendations to the Brazilian government concerning Amazon forest policy issues.

Latin American graduate students will receive training under the Biological Dynamics of Forest Fragments Project. This large-scale ecological study, now in its eleventh year, seeks to understand how forest fragmentation in Amazonian forests affects biodiversity conservation.

Also for Amazonia, the Woods Hole Research Center is conducting a study on restoring agricultural production on degraded lands. The study aims to reduce Amazonian deforestation and the associated releases of greenhouse gases by increasing the agricultural options available to residents of degraded lands.

Interactions of seven tree species and three forage grasses are being tested to develop more sound pasture management techniques. In addition, a database on the tree flora of the state of Pará is being compiled. So far, 950 species have been listed, with ethnobotanical and agroforestry information. Regeneration and seed characteristics of 80 tree species and seed predation characteristics of 15 species have been compiled. Several tree species have been identified that concentrate nutrients, especially phosphorous. Future studies will be built around this database as it develops.

Highlight on USAID Agroforestry Activities

Agroforestry has become an established focus of USAID activities. In 1990 and 1991, USAID supported agroforestry research and extension in 28 projects. Nineteen projects in 1990, and 17 in 1991, included agroforestry research. The Agency supported agroforestry extension in 16 countries: Bolivia, Chad, Comoros, Costa Rica, Ecuador, Guatemala, Guinea, Haiti, Honduras, Kenya, Lesotho, Nepal, Niger, the Philippines, Rwanda, and Sri Lanka. USAID's Forestry Support Program (see p. 21) and the Women in Development Office provided technical support to government extension agencies, local NGOs, and Peace Corps volunteers who were promoting agroforestry.

Research. USAID supported small agroforestry research efforts through contributions to various International Agricultural Research Centers—part of the CGIAR system. In Africa, the Agency provided research support to the region-wide agroforestry research network—AFRENA—coordinated by the International Council for Research in Agroforestry.

In addition, USAID helped agroforestry efforts in specific countries—such as Burundi, The Gambia, and Zaire—where agroforestry research efforts were integral parts of agricultural research projects. In Ecuador, the Agency supported agroforestry research and demonstrations in three different environments through the Forestry Sector Development Project. In Asia, the Agency continues to support agroforestry research through the Forestry and Fuelwood Research and Development Project.

Extension. In 1990 and 1991, USAID backed the extension of agroforestry practices in small farming systems, particularly in Africa, where the need for



Neem tree windbreaks in Niger

agroforestry is among the greatest in the developing world. Projects provided matching grants to various PVOs, including AFRICARE, CARE, Catholic Relief Services, and Save the Children. In addition, the Agency provided direct support for agroforestry activities to local NGOs and government extension services.

USAID's largest agroforestry extension effort was in Haiti. There, the five-year National Program for Agroforestry builds upon the achievements of the earlier Agroforestry Outreach Project. The Agency obligated \$4.7 million for this effort in 1990 and \$5.4 million in 1991.

Central America. USAID-sponsored regional agroforestry research and development (R&D) work is essentially complete. Technological packages have been developed for the 14 most promising tree species. To disseminate these R&D results, the Agency's focus is now on extension, which is being supported by country-specific USAID projects, as well as the regional RENARM project. (See p. 46) In Costa Rica and Guatemala, USAID promoted agroforestry in projects in conjunction with parks and park management. Agroforestry was being used in buffer zones near the parks to stabilize land use.

The publication of a special commemorative issue of the *Boletim do Museu Paraense Emilio Goeldi* dealing with valuable recent research results in the field of Amazonian botany also will be financed.

Focus on USAID Forestry Assistance

USAID's policies and directions concerning development assistance support related to tropical forestry have evolved greatly. From relatively modest levels in the early 1970s, activities have grown steadily and gained in scale and scope.

Background. Between 1975 and 1979, the number of and financial commitments to forestry and forestry-related projects began to rise within U.S. bilateral assistance. By the late 1970s, USAID began to play an even more active role in promoting forestry and natural resource-related activities, stepping up conferences and publications. In 1978, with the U.S. Department of State, the Agency sponsored the U.S. Strategy Conference on Tropical Deforestation. Other conferences focused on fuelwood issues and energy (in 1978 and 1979, respectively, sponsored by USAID's Bureau for Africa); energy, forestry, and the environment (in the Philippines in 1979, sponsored by USAID's Bureau for Asia); forest sciences in the tropics (in Costa Rica in 1979); and community forestry (in Burkina Faso with the Peace Corps in 1980). Also in 1980, USAID produced a policy discussion paper focusing on "Development Assistance in Forestry" and a report entitled "Forestry Activities and Deforestation Problems in Developing Countries".

By 1982, the Agency's strategy had evolved to focus on bilateral assistance to build forestry capacity in participating developing countries through training, research, technical assistance, infrastructure, and special studies. In addition, USAID emphasized the administration and use of U.S. food assistance (carried

out under Public Law 480) to encourage tree planting. At the time, USAID had 77 ongoing and 19 planned projects in 57 countries that supported forestry.

Five years later, the Agency had natural resource and environmental projects in more than 40 countries that supported forestry; most dealt with reforestation and agroforestry. The largest projects were located in sub-humid or semi-arid zones and involved a mix of reforestation, rehabilitation of degraded forests, and community forestry. By 1987, the Agency had become the world's largest bilateral assistance donor in terms of its support for forestry, natural resource, and environmental activities.

Agroforestry now plays an important role in the Agency's forestry-related activities and has become established in USAID-funded research and field projects alike. (See box on agroforestry, p. 17) Between 1977 and 1987, USAID supported agroforestry through 43 bilateral development projects, as well as international research projects and community development projects implemented with food assistance or through co-financing with PVOs. By 1989, people in developing countries were harvesting trees planted during many of USAID's earlier projects for firewood, polewood, or other uses.

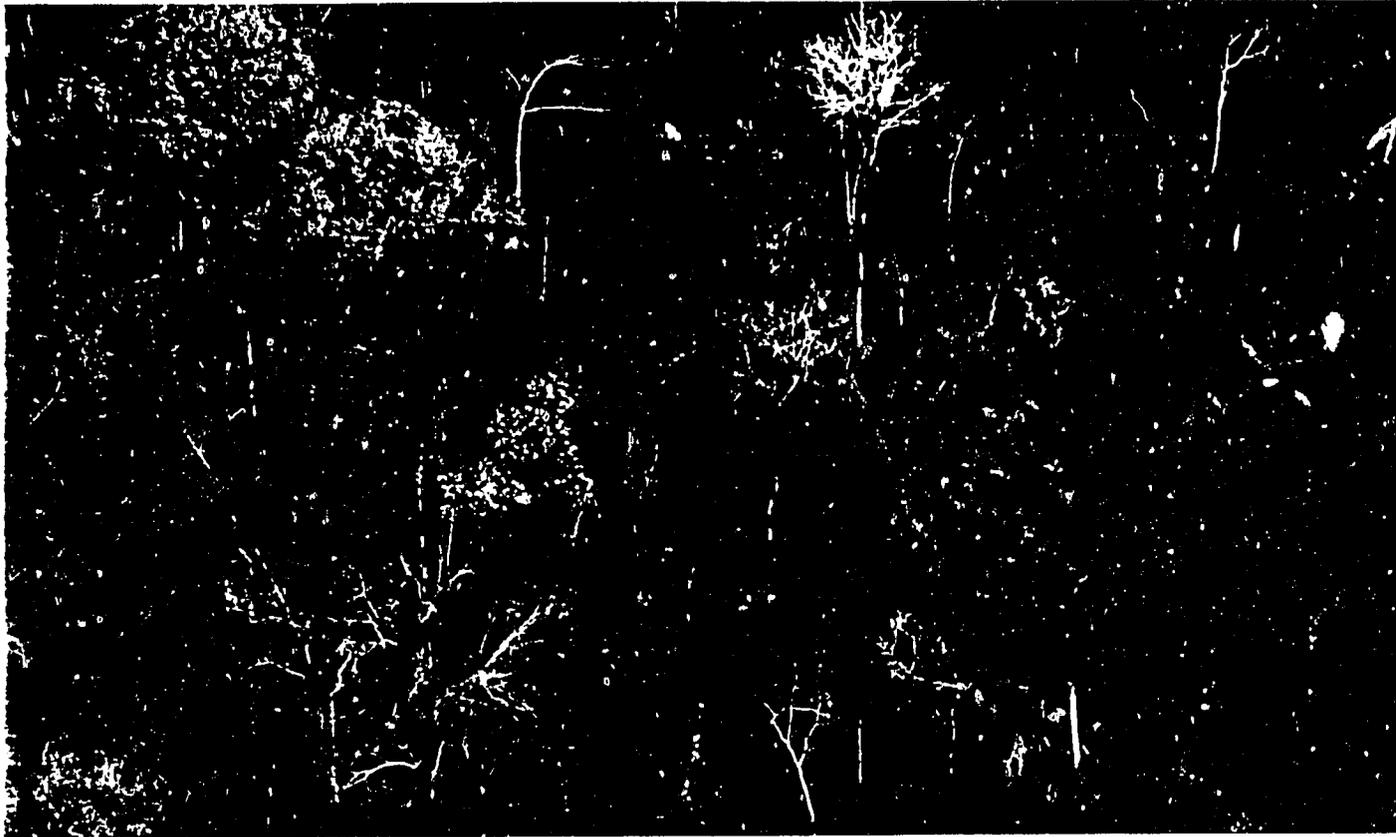
By 1987, the Agency had increased its capacity to deal with the sustained management of natural forests through 22 projects, along with nine projects that focused on protecting natural forests. In FY 1988, the Agency committed more than \$50 million for tropical forestry activities; that figure rose to more than \$76 million in FY 1989.

Strategic Context. In the last few years, each of USAID's geographic bureaus has moved to promote more



strategic planning and support for natural resources and forestry. USAID's Bureau for Africa developed a Plan for Supporting Natural Resource Management in Sub-Saharan Africa in 1987 and designed and implemented the Natural Resource Management Support (NRMS) Project. (See p. 29) By 1989, USAID's Bureau for Africa was actively carrying out this regional "umbrella" natural resources project that embraced actions in forestry, agroforestry, and the conservation of biological diversity, and included support for institutional strengthening, research, education, training, field action, and private voluntary organizations. The Latin America, Asia, and Near East bureaus also have taken actions to develop natural resource and environmental strategy statements.

Evolving Project Approaches. USAID's experience in forestry has



Mark Edwards/SHI Pictures

shown that the initial focus on technical interventions in tree planting and block fuelwood plantation plantings was much less viable—socially as well as economically—than agroforestry approaches that planted multi-purpose trees directly on farms. Natural forest management was also found to be a technically and economically viable alternative. In addition, three other factors were found to benefit agroforestry, forest management, and tree planting: increasing community participation; strengthening the capacity of forestry institutions; and encouraging those institutions to be more responsive to the needs of rural people who depend on forested land for their livelihoods.

Natural forest management and biological diversity conservation can be made complementary. Increasingly, USAID has sought both objectives in its projects—particularly broadly conceived natural resource management projects, which address

needs to manage parks and forest reserves, as well as the watersheds, soils, and water resources of adjacent agricultural buffer zones.

Toward the end of the 1980s, USAID added the need for improving policies and economic accounting of forest land and resource uses to its earlier emphasis on social forestry and agroforestry. Thus, projects started in 1990 and 1991 have included attention to policy questions, such as the way that forests are valued and concessions are awarded. Special attention also is being paid to the local participation in and social viability of forest management plans and policies.

Tropical rainforest canopy



*Rainforest botanical
diversity*

Mark Edwards SMI Pictures

Centrally Funded Programs

Several USAID centrally funded projects provide technical leadership in and assistance to Agency-backed activities in tropical forestry, biological diversity, and other natural resources. Projects include:

- The Forest Resources Management Project;
- The Biodiversity Support Program;
- The Development Strategies for Fragile Lands Project; and,
- The Coastal Resources Management Project.

Selected 1990-1991 highlights for these four projects follow.

The Forest Resources Management Project

The Forest Resources Management Project seeks to ensure a sustainable forest and natural resource base in developing countries. It has two main components: the Forestry Support Program (FSP) and the USAID/Peace Corps collaboration. The project was initiated by USAID in 1980 as a ten-year effort. A ten-year, \$25 million follow-up, FRM-II, got under way in 1991.

The Forestry Support Program.

The FSP provides technical consultation to USAID's bureaus and missions, as well as research support, forestry training, forestry program studies, and technical reference services. The program also manages a roster of 2,600 expert consultants in forestry and natural resources and provides technical support to the Peace Corps' programs in forestry and natural resource management. From 1988 to 1991, the FSP maintained the principal database for

USAID's forestry and related biodiversity conservation activities.

The FSP is jointly managed by two branches of the U.S. Department of Agriculture (USDA)—the Forest Service and the Office of International Cooperation and Development.

In 1990-1991, the program funded 73 technical consultancies in 35 countries.

FSP highlights for 1990-1991:

- In Costa Rica, USDA Forest Service law enforcement specialists provided technical assistance at the request of the USAID mission. A report entitled "Findings and Recommendations for Forestry Law Enforcement and Control of Illegal Logging and Log Transport" was prepared and used by USAID, relevant Costa Rican ministries, and the World Bank.

- In Indonesia, four U.S. consultants and three Indonesian counterparts assisted USAID/Indonesia's new Natural Resources Management Project in developing a research plan for Kalimantan. (See p. 35) Recommendations for development activities to support nature tourism in west Kalimantan were made and designs were prepared for a field research and training station.

- In India, an "Indo-U.S. Forestry Collaborative Program" was established with USAID/India. U.S. scientists visited India twice in 1990-1991. During month-long technical exchange visits, teams comprised of a silviculturist, a resource economist, and a biometrician worked with counterparts in four state forest departments and the Indian National Mission on Wasteland Development. Workshops and informal training sessions also were conducted.

- In Mali, in collaboration with a local consortium of NGOs, a national-

level workshop was conducted on improving the integration of women into natural resource activities. A follow-on workshop is scheduled for 1992.

- The FSP produced several publications in 1990-1991, including: *A Guide to Grants and Fellowships in International Forestry and Natural Resources*; the Spanish-language version of the handbook, *Planning for Agroforestry*; the French-language version of a 10-module training manual, *CARE Agroforestry Extension Training Sourcebook*; and *Training and Educational Opportunities in Agroforestry: A Directory of Institutions in the United States and Overseas*, which was made available to USAID, as well as to universities and training organizations.

USAID/Peace Corps Collaboration.

For some 30 years, USAID and its predecessor agencies have been collaborating with the Peace Corps on projects related to natural resources management. One of the most successful collaborative efforts has been in effect since 1980 through the Forest Resource Management Project's Participating Agency Service Agreement (PASA) with the Peace Corps in forestry and the environment. The agreement's objectives include:

- developing and promoting the use of techniques for tropical reforestation and natural resource conservation;

- providing material support for forestry, environmental education, and biological diversity projects;

- strengthening cooperation between USAID, the Peace Corps, the World Bank, PVOs, and NGOs work-

Protecting Biodiversity in Niger

In a region of exceptional biodiversity, USAID and the Peace Corps are supporting a project that combines community development, conservation education, environmental research, and natural resources management. The project focuses on an international priority area for protecting the African elephant centering on Park "W"—a major national park in Niger named after a W-shaped meander in the Niger River—and two protected areas with resident rural communities.

In 1990 and 1991, the Natural Resources Management Support Project (NRMS), administered by USAID's Bureau for Africa, contributed almost \$500,000 to develop and implement the Peace Corps' Conservation of Biological Diversity Project in Niger.

The project addresses several persistent problems, including the continuing decline and constant fluctuation in rainfall in the area and growing competition among rural communities for agricultural and pastoral land and other shrinking natural resources. The project promotes collaboration among government rural development services and rural communities. In its first year, the project initiated community development activities and conducted a regional socioeconomic study. In addition, the effort launched environmental research and monitoring activities in the park and supported park management and training.

In the next two years, efforts to assist park management and community development will continue. Environmental education will be a central focus.

ing in community natural resource projects supported by PL 480 food aid;

- expanding the number of trained Peace Corps volunteers serving in forestry and biodiversity projects; and,
- increasing the number of volunteers assigned to biodiversity projects, such as wildlife protection and environmental education.

1990 and 1991 highlights include:

Programming workshops. To encourage Peace Corps programmers to expand environmental projects at the country level, the USAID Peace Corps Natural Re-

sources PASA supported four regional workshops for Peace Corps staff in 1990. Workshops were held in Botswana, Fiji, The Gambia, and Tunisia for Peace Corps Country Directors and Associate Directors. More than 150 staff members participated.

As a result, the Peace Corps has expanded both the number of countries with environmental projects and the actual number of volunteers working to conserve forests and biological diversity in developing countries.

Environmental projects. In 1990 and 1991, environmental projects were launched in Bolivia, Cameroon, Chile, Côte d'Ivoire, Czechoslovakia, Hungary, Panama, Poland, Senegal, the Seychelles, Tonga, Uganda, and Uruguay. Volunteers are assigned to government forestry departments, university forestry departments, municipal government offices, parks, and wildlife services.

Environmental volunteers. The number of environmental volunteers serving in community forestry, parks, wildlife, and environmental education has steadily increased. In 1991, more than 700 volunteers worked on environmental projects.

Environmental education. This is the Peace Corps' fastest growing program in the environmental sector; it accounted for 70 percent of the growth in 1991. New volunteers now are being assigned to projects expressly to serve as formal or non-formal environmental educators. For example, volunteers in Paraguay are working in national park buffer zones with community groups, schools, churches, agriculture, and forestry extension agents, and political leaders to heighten awareness of environmental issues and organize local activities to promote conservation and environmental improvement.

The Peace Corps also is tapping into its largest cadre of volunteers—teachers—to undertake environmental education as a secondary activity. Considering that more than 3,000 volunteers train teachers or teach math, science, and English from the primary to the university levels, the potential for wide-ranging impacts in environmental education is enormous.

The Peace Corps also holds workshops around the world to encourage volunteer teachers and their counterparts in developing countries to incorporate environmental issues into curricula. For example, in Botswana, Central Europe, Fiji, Gabon, Malawi, Sri Lanka, Tonga, and Western Samoa, in-service training has been conducted for more than 150 volunteers and their counterparts.

In-service training. In 1990 and 1991, the Peace Corps provided in-service training on environmental issues and environmental education methods to more than 1,500 volunteers, 2,200 counterparts from developing countries, and 500 staff members in 33 countries worldwide. The training covered a variety of technical areas, including agroforestry, the conservation of biological diversity, environmental education, and management of natural parks and wildlife, as well as programming and training techniques.

USAID support for Peace Corps volunteer training included the writing of regional pre-service training manuals for agroforestry trainees serving in Africa and Latin America. In addition, USAID backed the design of a number of country-specific pre-service and in-service training modules to improve environmental projects, such as agroforestry in The Gambia, marine park management in the Seychelles, national park management in Poland, and environmental education in Botswana, Czechoslovakia, Hungary, and the South Pacific.

Other workshops. In 1990, the Peace Corps conducted a workshop for natural resource program managers from the Latin American region and their counterparts from developing countries in the Galapagos Islands of Ecuador. Workshop participants focused on concepts and techniques for managing buffer zones, including agroforestry, ecotourism, environmental education, and wildlife management.

The Biodiversity Support Program

After only three years, the Biodiversity Support Program (BSP) has grown to include a portfolio of more than 100 projects in 60 USAID-assisted countries. BSP is a consortium of the World Wildlife Fund, The Nature Conservancy, and the World Resources Institute that carries out technical assistance, research, training, information networking, and pilot demonstration projects. It is funded by USAID through a cooperative agreement with the World Wildlife Fund.

The growth in the portfolio of projects is a result of the rapid addition of USAID mission and bureau conservation activities at the country level to the core program. From initial funding in 1988 of less than \$1 million, regional funding for the first fully year of operations in 1989 reached almost \$2 million. In 1990, the program received almost \$3.2 million and rose to more than \$5.1 million in 1991.

Highlights in 1990-1991 follow:

Technical assistance. The BSP has funded a wide range of efforts:

- In the tropical Pacific, a preliminary inventory of ecosystems is being conducted by The Nature Conservancy and the South Pacific Regional Environmental Program (SPREP)—the technical coordinating environmental agency for the

Conserving Central America's Natural Resources

A continuing Peace Corps role in conserving this region's forests and other environmental resources is being supported by USAID's Regional Environmental and Natural Resources Project (RENARM).

Under a June 1990 agreement between the Peace Corps' Office of Training and Program Support and USAID's Regional Office for Central American Programs, funds from the RENARM project will support the Peace Corps' environmental projects in Central America. Peace Corps volunteers and their counterparts in Belize, Costa Rica, Guatemala, Honduras, Nicaragua, and Panama are benefiting from the increased training, programming, and materials support. For example, in Belize, with RENARM funds, the Peace Corps hosted a workshop to train counselors in the newly created Belizean Youth Conservation Corps. In Honduras, Peace Corps utilized RENARM funds to conduct an environmental media workshop for print and electronic media. As a result of the workshop, the

region's 22 countries and territories. When completed in December 1991, the project will provide information needed to conserve biodiversity in Pacific ecosystems.

- In Amazonian Bolivia, a dendrological survey was conducted in the Elias Menezes Experimental Forest, a 54,700-hectare area of forest and wetland in eastern Santa Cruz province. The survey revealed a number of range extensions for Amazonian trees and included several new records for the flora of Bolivia. The survey will play a key role in facilitating the development of a management plan currently being devised for the forest.



participating journalists formed an environmental network for support and information. RENARM funds also enabled Peace Corps to sponsor seven volunteers and six students from three Central American countries to attend courses in agroforestry, buffer zone management, extension methodology, and financial and technical support for protected areas through the University of the Peace in Costa Rica.

Tree nursery

- In Ecuador's Podocarpus National Park, an ecological assessment was conducted of the mid-altitude cloud forest habitat and wildlife under a variety of human resource uses. Baseline surveys have covered a substantial area of the park, including fringe sections particularly threatened by hunting, gold mining, and selective logging.

- In Belize, assistance was provided to the government to establish a conservation division which will focus on centralizing and expanding the management of the country's parks and protected areas. Local



NGOs received support to conduct a habitat survey to establish priorities for areas to be incorporated into a protected area system.

- To protect Africa's Lake Tanganyika, one of the most unusual biotic resources in the world, the first International Conference on the Conservation and Biodiversity of Lake Tanganyika was held in March 1991 in Bujumbura, Burundi. The conference brought together 65 scientists, conservation specialists, resource managers, and officials from 12 countries. Participants proposed a number of specific measures to promote conservation and address environmental threats to the lake and called for international cooperation to address environmental problems relevant to the Lake Tanganyika basin.

The lake, the largest of the African rift lakes, harbors more than 500 endemic species, most of which have evolved *in situ* within the lake basin. Despite its importance in maintaining biodiversity and serving as a resource for the region's people, the lake receives little legally mandated environmental protection. Increases in suspended sediment and sedimentation rates, particularly in the lake's northern waters, have had a serious impact on biodiversity. The confer-

ence was a significant step in laying the foundation for conserving the lake and basin area and conducting long-term research and monitoring.

- In Tanzania, a workshop was held on Mafia Island in October 1991 to approve a plan for the creation of the Mafia Island Marine Reserve. The marine resources in the waters around Mafia Island are among the richest in biodiversity on the East African coast. The island's economy is highly dependent on the area's marine resources, particularly fisheries. Those fisheries are under severe pressure caused by overuse of seine nets and the loss of the area's coral reefs, which are important nursery and feeding areas.

The workshop brought together some 80 local users and community members, as well as representatives from the University of Dar es Salaam and other universities, the Tanzania Wildlife Conservation Society, the FAO, and the government of Zanzibar, to discuss conservation measures that would protect the area's resources while sustaining local livelihoods. Additional planning for conservation and design of institutions to manage a reserve is under way.

Research. The BSP funded a wide range of research studies in 1990-1991 through its small research grants program. This program not only helps address the critical need for information about tropical biological diversity in developing countries, but also provides much needed support for field work by researchers from those countries.

In 1990, 45 research grants of \$15,000 each were awarded: 26 for the Latin America and the Caribbean region; 11 for Africa; and eight for Asia and the Pacific region. Representative examples include:

- A grant to support an effort by the Bangladesh National Herbarium to assess the biodiversity of the Teknaf Game Reserve. The reserve, located in southeast Bangladesh, faces severe threats from human activity. While established to protect the elephant population, the reserve has no effective controls to stop human encroachment or grazing by livestock. Plant diversity is in urgent need of inventory. Research efforts will focus on identifying key plant species of ecological and socioeconomic value, establishing their links with wildlife, evaluating the current use patterns of the biological resources of the reserve, and making recommendations for sustainable use of the reserve's biodiversity.

- A grant to Yale University's School of Forestry and Environmental Studies will investigate the importance of forest fragments in maintaining regional biodiversity in an area adjacent to Costa Rica's Monteverde Cloud Forest Reserve. Basic ecological data will be compiled on the dynamics of forest fragments in tropical agricultural landscapes. These will be used to develop recommendations for the area's conservation and sustained use. A focus will be trees in the avocado family (Lauraceae) that are an important component of the Monteverde Cloud Forest and adjacent forest fragments. Most of the 23 species of

lauraceous trees found locally depend on birds to disperse their seeds. The principal bird species capable of feeding on the Lauraceae's fruit—the resplendent quetzal, the three wattled bellbird, the emerald toucanet, and the black guan—depend on forest patches outside the reserve for at least part of the year. The project will quantify the importance of fruit-eating birds to the Lauraceae's dispersal within forest fragments. The effort will integrate this and other information into steps to manage and conserve privately owned forest fragments in the buffer zone around the Monteverde Cloud Forest Reserve.

- A project will address the possibility of establishing kitchen gardens for indigenous food species in a Maasai group ranch area in Kenya's Kajiado District. Research will help conserve food species that have become rare as land has been degraded. The effort also will conserve biodiversity by reducing pressure on food species collected from the wild.

- Other research efforts include a Princeton University study on the effects of selective logging on Dipterocarp forest regeneration in Kalimantan, Indonesia; and research on the basic ecological and socio-economic data necessary for developing sound policy and management approaches for Sri Lanka's Horton Plains National Park.

Training. The BSP supported a series of training activities through the World Wildlife Fund's Organizational Development Program, which strengthens government and non-governmental institutions that deal with natural resource management and conservation. Five workshops attended by more than 100 natural resource professionals from developing countries were conducted in 1990-1991. They focused on biodiversity research and project proposal design, strategic planning, financial resource development, and

participatory leadership. Publications on proposal design and financial resource development were produced.

Information Networking. A wide range of publications was issued in 1990 and 1991 through the BSP, including *Investing in Biological Diversity: U.S. Research and Conservation Efforts in Developing Countries* (Janet Abramovitz, 1991) and three volumes of *Flora of Thailand*.

A quarterly newsletter "Tropinet" was initiated in April 1990 with BSP help as a supplement to the Association for Tropical Biology journal *Biotropica*; it is distributed by electronic mail to subscribers.

In addition, the BSP subsidized 20 subscriptions per year to the Society for Conservation Biology's journal *Conservation Biology*, which disseminates and discusses critical ideas in conservation theory and management. The three-year subscriptions are to go to conservation scientists in developing countries where economic circumstances limit subscriptions.

As part of its information networking component, the World Wildlife Fund's BSP staff hosts a monthly seminar series for the Washington-area conservation community on topics relevant to the conservation of biological diversity.

Pilot demonstration projects. A wide range of activities took place in 1990 and 1991 under the BSP's pilot demonstration projects component. Among the years' highlights:

- In Central and Eastern Europe, a project to promote the protection and enhancement of biodiversity in the region's newly democratizing nations will soon be carried out. The project was initiated in 1991 by the BSP in cooperation with the U.S. National Park Service. It will focus on a select number of "ecological bricks"—potential protected areas identified by a consortium of 50 conservation organizations in Central and Eastern Europe. Among the sites to be considered is a trans-

national park in the mountains of Poland's Bieszczady region. Other technical assistance and training activities for the region's countries also will be developed.

- In Thailand, 16 major NGOs joined forces to organize a national seminar in January 1990 to focus government attention on some of the country's key natural resource and environmental problems. More than 900 participants attended the highly publicized seminar and a set of resolutions was given to the Thai prime minister.

- Also in Thailand, support was

The Biodiversity Support Program finances field work by developing country researchers.

provided to strengthen the capability of the Wildlife Fund of Thailand to administer and support a small grants program for research and conservation.

- In western Thailand, a detailed botanical collection of plant species was initiated by the Royal Forest Department Herbarium in the Huay Kha Khaeng-Thung Yai Naresuan Wildlife Sanctuaries. By July 1991, some 700 samples were collected. A publication will describe the taxonomy, botany, ecology, and natural history of many of these species.

- In Nepal, continued support was provided for the King Mahendra Trust for Nature Conservation to administer the Annapurna Conservation Area Project. The project directly links conservation with the quality of life and basic needs of the people living in an environmentally sensitive, mountainous region of Nepal. The project is expected to become sustainable in the near future with income from trekker fees.

- In the Himalayas, the International Council for Bird Preservation (ICBP) will implement a strategy to protect the forest habitat of tragopan birds. The council will develop a database for land planning to ensure that western tragopan birds are adequately protected by the Himalayan Jungle Project in Pakistan.

- In Indonesia, technical assistance was provided to the government to strengthen the management of natural resources by the Ministry of Forestry, Directorate General of Forest Protection and Nature Conservation. A senior advisor from the U.S. National Park Service helped establish national and local conservation priorities and train middle managers in conservation planning and practice.

- In the South Pacific, The Nature Conservancy conducted a feasibility study to establish a network of conservation data centers. A prototype is being developed for Western Samoa.

- In The Gambia, a preliminary biological and social assessment of Kiang West National Park was completed in 1990. A more comprehensive, yearlong assessment of the park by the BSP is under way and is expected to result in the development of a park management plan.

The park, located on the Gambia River, has been identified as a priority protected area by the Gambian government. The area in and around the Kiang West National Park is one of the country's most important remaining habitats for wildlife. Because the park area has been severely threatened by such human activities as livestock production, agriculture, fire, and poaching, the government requested that an assessment of the situation and a conservation management plan be developed to both protect its resources and to meet the needs of the local inhabitants on a sustainable basis.

Stephen D. Schatz, U.S. National Park Service



Fijian iguana

A mid-term evaluation report on the Biodiversity Support Program was completed in October 1991. The overall conclusion was that the program has been extraordinarily successful and has given USAID access to the broader conservation and development community; more than 50 separate institutions have been involved in more than 100 activities in 60 countries.

The Development Strategies for Fragile Lands Project

The Development Strategies for Fragile Lands (DESFIL) Project helps improve local, national, and regional strategies for managing fragile lands in Latin America and the Caribbean on a sustainable basis.

The project was initiated in 1986. Its midterm evaluation in late 1989 confirmed that DESFIL assisted virtually every mission in the region in addressing critical environmental and natural resource management concerns. For example, at the request of the Guatemala mission, DESFIL helped prepare a Tropical Forestry Action Plan for Guatemala. For Ecuador, DESFIL completed an English-language version of *Natural Resource Management in Ecuador: A Strategy for USAID*.

DESFIL has undertaken a number

of studies to examine the socioeconomic and institutional dimensions of fragile land management. These include topical studies in watershed management, biological diversity, and other areas. DESFIL also has identified and tested a variety of assessment and evaluation methodologies; undertaken interest group and stakeholder analyses; carried out environmental education program designs; and provided information on erosion control methods.

During 1990 and 1991, DESFIL disseminated eight newsletters in English and Spanish. It also published 16 monographs and several reports to advance knowledge of fragile lands issues. Among these is the *Fragile Lands Synthesis Report*, which covers such issues as the nature of the fragile lands problem; technologies for fragile lands management; economics and resource use; environmental analysis; education and extension; and methods and recommendations for action. A natural forest management video also was prepared.

DESFIL helped organize and host the Humid Tropical Lowlands Conference in June 1991 in Panama City, Panama, with the cooperation of the U.S. Forest Service and Conservation International.

The Coastal Resources Management Project

The Coastal Resources Management (CRM) Project provides support for the conservation of coastal forests, as well as for the diversity of biological resources found in different coastal environments. The project was initiated in 1985 and is implemented through a cooperative agreement with the University of Rhode Island.

Central to the project is an approach aimed at building local capacity to formulate and implement integrated coastal resources management programs. The project includes

an institution strengthening component that helps create centers of excellence in coastal resources management. In 1990, for example, the Coastal Resources Institute was established at the Prince of Songkla University in southern Thailand.

Initially, three pilot programs were established in Thailand, Sri Lanka, and Ecuador.

Thailand. This effort was launched with a demonstration project in Phuket province. The project stressed the early testing of management techniques that could be implemented at the local level and directed at selected coastal problems, including water quality and coastal watershed management; the economics of tourism; and marine protected area management.

Coral reef protection in Phuket province and its surrounding areas was selected as a priority because Phuket's coral reef habitat is considered significant locally and nationally for both its ecological values and its economic benefits from fisheries and tourism. A Coral Protection Strategy was developed by the CRM Project to identify, through local consultation, measures that could be implemented to better manage the reefs to enable them to be used on a sustainable basis for coastal tourism, fisheries, education, and other activities that underpin Phuket's economy.

The Coral Protection Strategy is being implemented in Phuket Province and in Phi Phi National Park. By June 1990, a National Coral Reef Strategy that builds on these efforts had been completed and adopted by the Thai government.

Sri Lanka. Sri Lanka was chosen as a pilot because of its leadership

ratified the Sri Lanka Coastal Zone Management Plan (CZMP)—an effort prepared through the CRM Project. Implementation of the plan is under way.

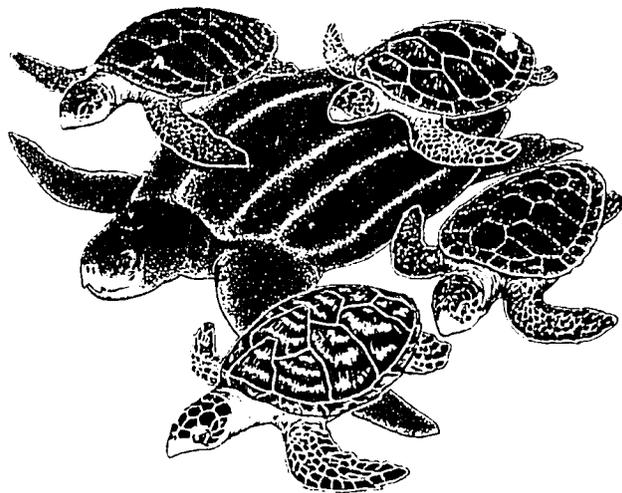
Other successfully completed 1990 target activities included training district officers on the CZMP as a first step toward decentralizing authority from central to local governments. USAID/Colombo is building upon the CRM pilot approach to design the mission's Natural Resources and Environmental Policy Project. A comprehensive report, *Coastal Sri Lanka—An Agenda for the 1990s*, was published in 1990.

Ecuador. In Ecuador, a national coastal resources management program was adopted by presidential decree in January 1989; the action built on the CRM Project's technical work and an innovative public participation effort. Key features of this program, including the creation of an interministerial CRM commission, became operational in 1990. The government of Ecuador is funding a new governmental unit, the Technical Secretariat to the Commission. Leadership and support for the national CRM program are being augmented by the Fundación Pedro Vicente Maldonado—a Guayaquil-based PVO dedicated to sustainable use of natural resources in the coastal region—as well as a growing number of interagency working groups, teams of Ecuadoran experts, local coordinators, and members of the advisory and executive committees in each of five special area management zones. In addition, interagency teams called "ranger corps" have been formed to improve enforcement of existing laws and regulations.

pleted in May 1991. Proceeds will provide three years of income in local currency for the public education and outreach programs carried out in support of Ecuador's CRM program by the Fundación Pedro Vicente Maldonado.

Other 1990-1991 Activities.

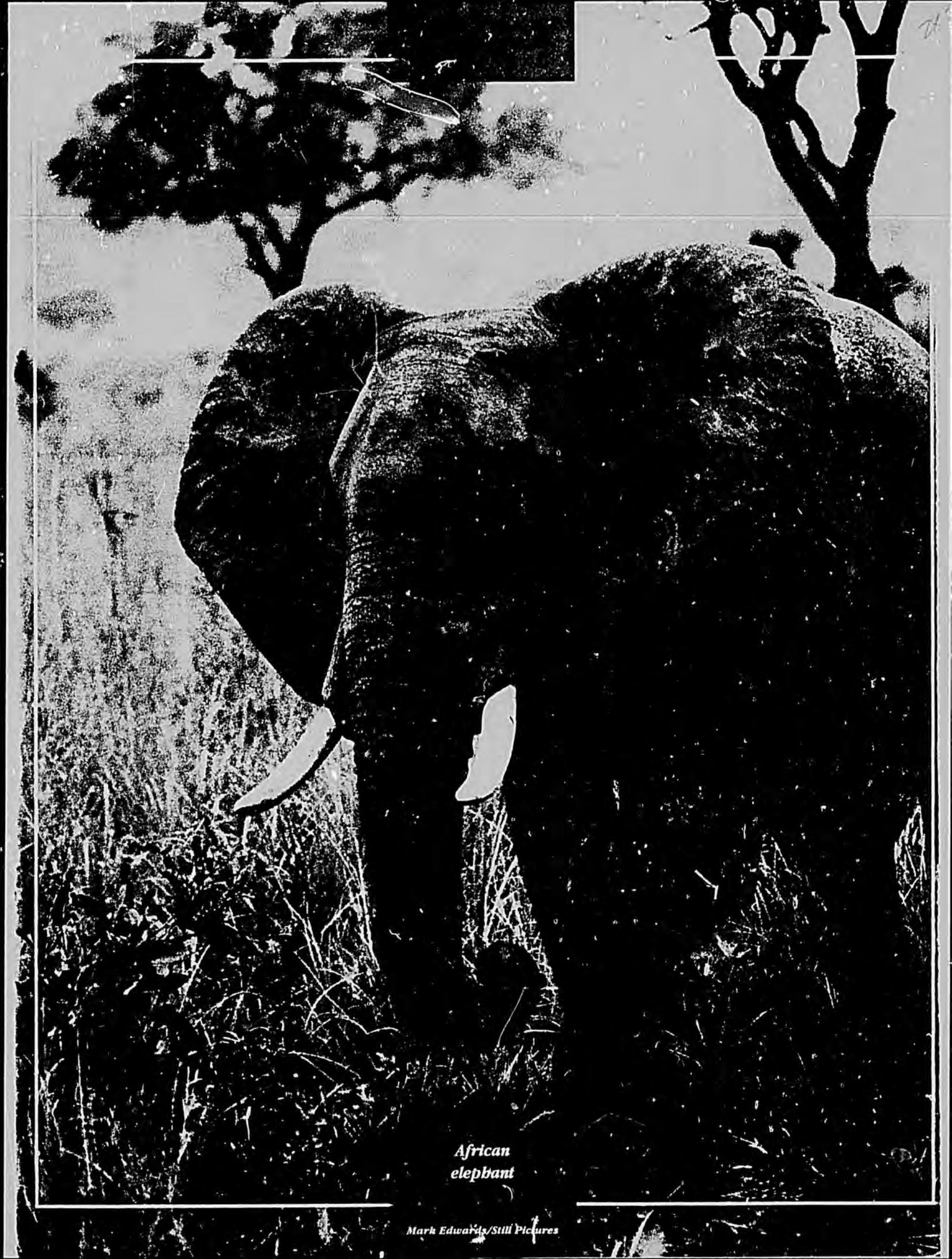
- A regional workshop was held in September 1991 to define an agenda for action for coastal management in Central America;
- Nine case studies on aspects of U.S. coastal management experience were prepared for developing country practitioners through a cooperative effort between the U.S. National



Oceanic and Atmospheric Administration and USAID; and,

- The first summer Institute in Coastal Management was held at the University of Rhode Island in June 1991. Twenty-three participants from 13 nations attended the three-week short course.

Sea turtles



*African
elephant*

USAID's Activities in Africa

The natural resource base in Africa continues to be seriously threatened and degraded at an alarming rate. The tragic result is a decline in agricultural productivity and food security in many of the continent's regions. Only about one-fifth of African soils are arable, and many of these are continually threatened by loss of topsoil and fertility. Moreover, the closed tropical forests of Sub-Saharan Africa have been disappearing at a rate of about 2.7 million hectares per year—an area the size of Swaziland. Meanwhile, vast tracts of economically valuable species of flora and fauna and their habitat are quickly disappearing.

The causes of natural resource mismanagement in Africa can be found in the same set of fundamental problems that lie at the heart of Africa's development crisis: rapid population growth and enduring economic stagnation and poverty.

The decline in the overall stability and productivity of Africa's natural resource base results from a complex and interrelated series of resource degradation processes. For example, loss of vegetative cover in critical watersheds may increase soil erosion, reduce the availability of water, decrease biological diversity, and cut productivity downstream and in coastal estuaries.

Perhaps more than in any other continent, the productivity and well-being of Africa's agrarian and pastoral peoples are directly linked to the wise use and conservation of the natural resource base. While broad agreement exists among those concerned with development in Africa that agriculture should be the primary "engine of growth", it is clear that promoting agriculture will require special attention to restoring



Daisy Wisnamb, African Wildlife Foundation

and maintaining environmental stability. This can be accomplished only by strengthening the linkages between natural resources management, agriculture, and rural development and by fostering a participatory approach that builds on the inputs—land, labor, capital, and technology—available to rural people.

Often, much attention is focused on technical goals, without sufficient attention being paid to the policy, administrative, legislative, and institutional framework. For this reason, USAID's Bureau for Africa supports national policy development activities such as World Bank Environmental Action Plans (EAPs)—a process that helps governments identify environmental issues; make legislative, policy, and institutional reforms; implement environmental measures for current and future projects; and develop natural resources management programs.

The Natural Resources Management Support Project (NRMS)

The \$28.4 million NRMS Project was initiated in 1987 to help missions develop long-term natural resource

management strategies and implement the Bureau for Africa's Plan for Supporting Natural Resource Management in Sub-Saharan Africa. Under that plan, the priority problems for action are soil erosion and loss of fertility; loss of vegetation; and threats to biological diversity.

The NRMS Project provides technical assistance to conduct analytical studies and workshops, strengthen NGOs, and assist USAID missions. Key NRMS activities include:

Natural resource management country assessments. These assessments, which include biological diversity and tropical forests, identify promising interventions at the farm level as well as the requisite socioeconomic conditions and economic incentives for farmers to manage natural resources in a sustainable way. Information derived from the assessments also is used to develop natural resource action plans for a given country. Often, the assessments and the action plan are used as a basis for USAID missions to design bilateral natural resources management projects.

Focus on African Elephants

The sharp decline in the population of African elephants—particularly in East Africa—during the last 15 years has prompted concern in Africa and the rest of the world and spurred action to increase management of African elephant populations.

USAID has made special efforts to incorporate attention to elephant conservation into its programs. To that end, the Bureau for Africa's African elephant conservation activities focus on managing wildlife habitats and associated rural development activities on a sustainable basis.

In FY 1990, Congress earmarked \$2 million for USAID for African elephant conservation. The Agency met this earmark through major new projects in Niger, Cameroon, and Tanzania. In all in Africa, USAID supported more than \$10 million in direct and indirect elephant conservation and management activities through those new actions, as well as ongoing activities in Botswana, Kenya, Zambia, and Zimbabwe, and regional efforts. In FY 1991, Congress earmarked \$5 million to support African elephant conservation and management. USAID initiated major activities in Ghana and Uganda.

In Uganda, the USAID mission will support elephant habitat management in such areas as Queen Elizabeth National Park and work with affected human populations in the Bwindi National Park and Kibale Forest Reserve.

In Niger and Cameroon, the Agency continues smaller scale activities. Regionally, through the African Wildlife Foundation, the Bureau for Africa committed support for the development of country-specific elephant management "action plans" for 14 countries: Angola, the Central African Republic, Côte d'Ivoire, Equatorial Guinea, Guinea Bissau, Guinea, Malawi, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Zaire, and Zambia. These national elephant plans were discussed at an elephant range states meeting in Nairobi, Kenya, in January 1992.

In 1990 and 1991, the NRMS project staff assisted in developing bilateral natural resource management programs in 10 countries: The Gambia, Guinea, Kenya, Madagascar, Mali, Niger, Rwanda, Senegal, Uganda, and Zimbabwe.

Strengthening NGOs and PVOs.

The NRMS project awarded 14 direct grants or cooperative agreements to private voluntary and other organizations—including the African Wildlife Foundation, the N.Y. Zoological Society, and the World Wildlife Fund—to initiate natural resource management programs, particularly to conserve biological diversity.

Through the PVO/NGO Strengthening Project—a cooperative agreement with the Experiment in International Living, CARE, and the World Wildlife Fund—some 200 African NGOs have increased their institutional capacity to develop and implement natural resources projects. This was accomplished in the last two years in more than one dozen workshops in such countries as Cameroon, Kenya, Madagascar, Mali, and Uganda.

Workshops. The NRMS project also supported a number of workshops on issues related to natural resource management. For example, the Buffer Zone Management in Africa Workshop held in Uganda's Queen Elizabeth National Park in October 1990 brought together 60 participants—including local resource users, NGO representatives, and government officials from 10 countries—to explore issues associated with buffer zone management. Case studies were presented and recommendations were made regarding buffer zone management. Participants made site visits to buffer zones and met with local residents in Uganda's Rwenzori Forest Reserve, Kibale Forest Reserve, and Queen Elizabeth National Park.

Special studies. NRMS funded a number of special studies in 1990 and 1991, including the environmental profile *Preliminary Review of Namibia's Natural Resources* and the guidebook *A Conceptual Approach to the Conservation and Management of Natural Forests in Sub-Saharan Africa (Arid and Semi-Arid Forests and Woodlands)*. The guidebook, prepared by the Vermont-based Associates in Rural Development (ARD), presents an analysis of important topics associated with natural forest management, including economics of natural forest management, forest inventory tools, and techniques and suggested information for developing a forest management plan. The publication has been broadly distributed throughout Africa.

As required by Congress under the Development Fund for Africa, (see box, p. 33) key analytical work has been undertaken to measure the impact of NRM interventions and policies. The methods to measure program impacts currently are being tested in USAID missions and associated field projects. The World Resources Institute, under the Environmental Planning and Management project, produced two publications to support this analysis: *The NRM Framework: What It Is, What It Does, and How It Works, with an Example from the Field*; and *NRM Indicator Catalogue for Use of the NRM Framework*.

The NRMS project will end in 1992. Natural resources management activities will be undertaken under a project now being designed. This new effort will be managed by the Food, Agriculture, and Resources Analysis Division (FARA) in the newly formed Office of Analysis, Research, and Technical Support within the Bureau for Africa.

Uganda: The Action Program for the Environment. Among new initiatives in Africa is the 1991 Uganda Action Program for the Environment

(APE). The project will help Uganda's public and private sectors effectively and sustainably manage the natural resources base in selected areas of the country. A policy component of the project—to be implemented through a national environmental action plan—will examine Uganda's laws, policies, institutions, and objectives related to the environment and recommend necessary policy reforms to the Government of Uganda. Support also will be provided to implement institutional reforms—such as reorganizing institutions responsible for the environment—and to set clear mandates and operating procedures in this area.

A rehabilitation and resource conservation component of the Uganda APE will provide grants to PVOs and NGOs to support tree planting and agroforestry activities, conservation education, and ecotourism development. The private sector also will receive support to complete environmental impact studies, as required by new Ugandan legislation.

In addition, the project will provide support for three newly created national parks and increase protection for forest reserves. Assistance will be provided to Uganda National Parks and the Forests Department to rehabilitate and protect national parks and forest reserves. The project also will help establish a National Information Center for the Environment to help improve an existing environmental geographic information system.

Senegal: The Reforestation Project. The project, which aims to fight desertification, was initiated in 1986 by the Bureau for Africa.

The effort aims to directly and indirectly benefit farmers by spreading and sustaining tree planting. Activities focus on reducing the financial risks that farmers face when they reforest land. The program's effectiveness stems in no small measure from the fact that farmers have a vested interest in the effort's success



because they share the costs of planting trees.

The project has five components: matching grants to farmers; roadside tree planting; private sector development; training; and a media program.

In the program's first year, more than 200 hectares were planted or covered with windbreaks, fencing, plantations, and orchards to help slow the process of desertification. Small private enterprises have been employed to plant trees along selected roads. That effort not only encourages reforestation in urban and rural areas, but also increases the demand for plants, thus stimulating the development of private nurseries. By promoting private sector opportunities, as well as strengthening the efficiency of existing markets and facilitating policy implementation, the program's private sector component is helping to increase private investment in the forestry sector.

The project also provides training in management principles, agro-

forestry, forestry extension, and private sector development. A media campaign is promoting mass participation in reforestation activities. More than 24 reforestation-related radio messages in French and six national languages have been broadcast, and school reforestation programs have been established.

Implemented through an agreement between USAID and the government of Senegal's Ministry of Rural Development and Water Resources, the effort has been carried out by Louis Berger International Inc. and the Southeast Consortium of International Development (SECID). The 1990 mid-term evaluation concluded that the project has made good progress toward achieving its goals and purpose.

Madagascar: Protecting Biological Diversity. Madagascar, which contains some of the world's most important biological diversity habitats, has been identified as a priority for biological diversity management by both the Bureau for Africa's Plan for Supporting Natural Resources Management in Sub-Saharan Africa

The spectacular crested crane is the national bird of Uganda.

and its strategy for biological diversity and tropical forests.

USAID-supported biological diversity programs in Madagascar began in 1987 through country grants awarded to PVOs, botanical gardens, and universities—including the World Wildlife Fund, Catholic Relief Services, Duke University, and the Missouri Botanical Gardens.

Over the years, this assistance has increased to include participation with the World Bank in the development of a National Environmental Action Plan (NEAP) for Madagascar, initiated in 1987. The NEAP process aims to help establish a framework for integrating environmental considerations into a nation's economic and social development. USAID has taken the lead in supporting programs to establish sustainable human and natural ecosystems in areas of Madagascar where biological diversity is threatened and in helping define and implement reforms to address the key policy, institutional, and administrative constraints that limit effective environmental management.

USAID launched an effort in 1990—the Sustainable Approaches to Viable Environmental Management (SAVEM) project—to establish sustainable human and natural ecosystems in areas of Madagascar where biological diversity is threatened. An important premise of the SAVEM project is that sustainable natural resources management must provide direct economic benefits to the people of Madagascar.

The project has two primary components: a PVO grants component focused on managing protected areas; and the establishment of the National Association for the Management of Protected Areas (ANGAP), a parastatal organization that will coordinate, monitor, and plan protected

area activities. ANGAP will make policy recommendations and develop a monitoring and evaluation capability. Malagasy staff will be trained to establish and operate a protected area tracking system using geographic information system technology. Education and communication also will be focuses of ANGAP activity.

Another USAID initiative—the Knowledge and Effective Application of Policies for Environmental Management Project (KEAPEM)—is currently under design. KEAPEM aims to strengthen public policy support for managing biological diversity. The project will strengthen the capacity of Madagascar's National Office of the Environment to develop and enact environmental policies. In addition, KEAPEM will establish a National Environmental Trust Fund as an endowment to encourage and facilitate natural resource management activities.

Kenya: Safeguarding Wildlife.

Wildlife is a key economic asset in Kenya. Tourism, which is based largely on wildlife, is Kenya's largest foreign exchange earner. In 1988, for example, tourism earned the country some US\$349 million. At the local level, however, the importance of wildlife is not always understood. Often, people living near wildlife preserves view wildlife not as an asset to development, but as a hindrance. In particular, the Maasai who live outside the 20,813-square-kilometer Tsavo West National Park in neighboring ranches faced a lack of grazing land for their livestock. The Maasai once used the national park as the primary grazing area for as many as 50,000 head of cattle. The park is home to both the threatened elephant and the black rhinoceros.

The African Wildlife Foundation, with USAID support, has been laying the groundwork for a community-based conservation project around the park that is reducing grazing



Stephen D. Nash/Conservation International

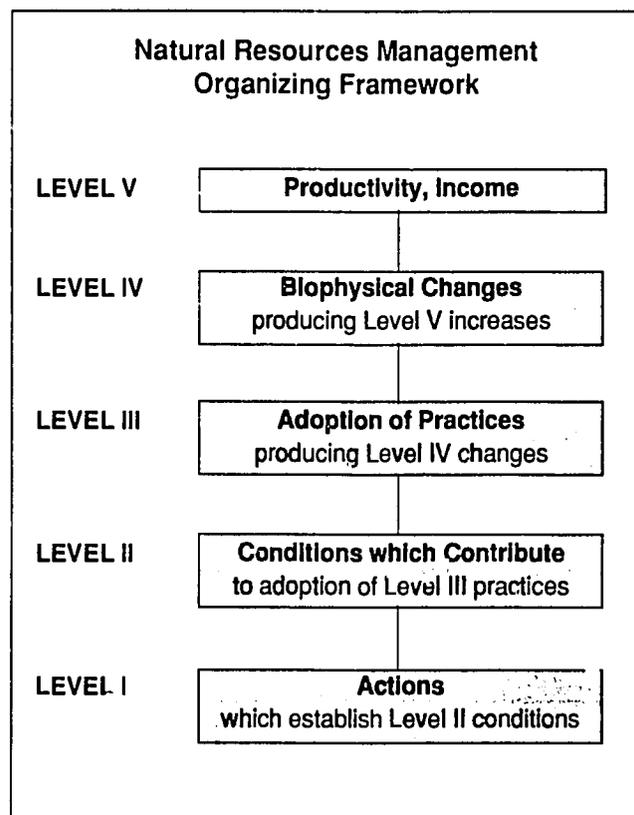
while helping the Maasai benefit from park tourism. The Tsavo Community Conservation Project, initiated in 1989, established a dialogue between park authorities and local groups. Through workshops and village-level meetings, the project was able to motivate local communities to remove some 10,000 cattle from the park in 1990. The project is now working with the Maasai to develop options outside the national park so the Maasai community can benefit from wildlife and help manage the area's wildlife as a valuable resource. For example, the local Maasai chief recently proposed that a five-kilometer buffer zone be established in the area stretching from the park to the nearby Maasai ranch settlement. Not only would the buffer zone inhibit the Maasai from using the park for cattle grazing, but it would allow the Maasai to generate revenue from such wildlife-based options as tented camp concessions, campsites, and donkey safaris. Moreover, the Kenya Wildlife Service recently stated that a fixed percentage of tourist gate receipts from national parks will be channeled back to local communities. Such efforts will further conservation in Tsavo West and other Kenyan national parks.

Monitoring the Impacts of USAID Activities

The Bureau for Africa implements its development program through the Development Fund for Africa (DFA) and its associated action plan. (See box, p. 13) Congress established the DFA in 1987 to enable the Bureau for Africa to develop innovative, multi-disciplinary activities to promote economic development in Africa. Lawmakers stated that the bureau's progress under the DFA would be measured not by the amount of funds obligated by line items, but by demonstrated impact. Under the DFA, the Bureau for Africa has focused on two areas: conserving natural resources as key to promoting long-term increases in productivity in all sectors and developing new technologies that permit resources to be used more efficiently.

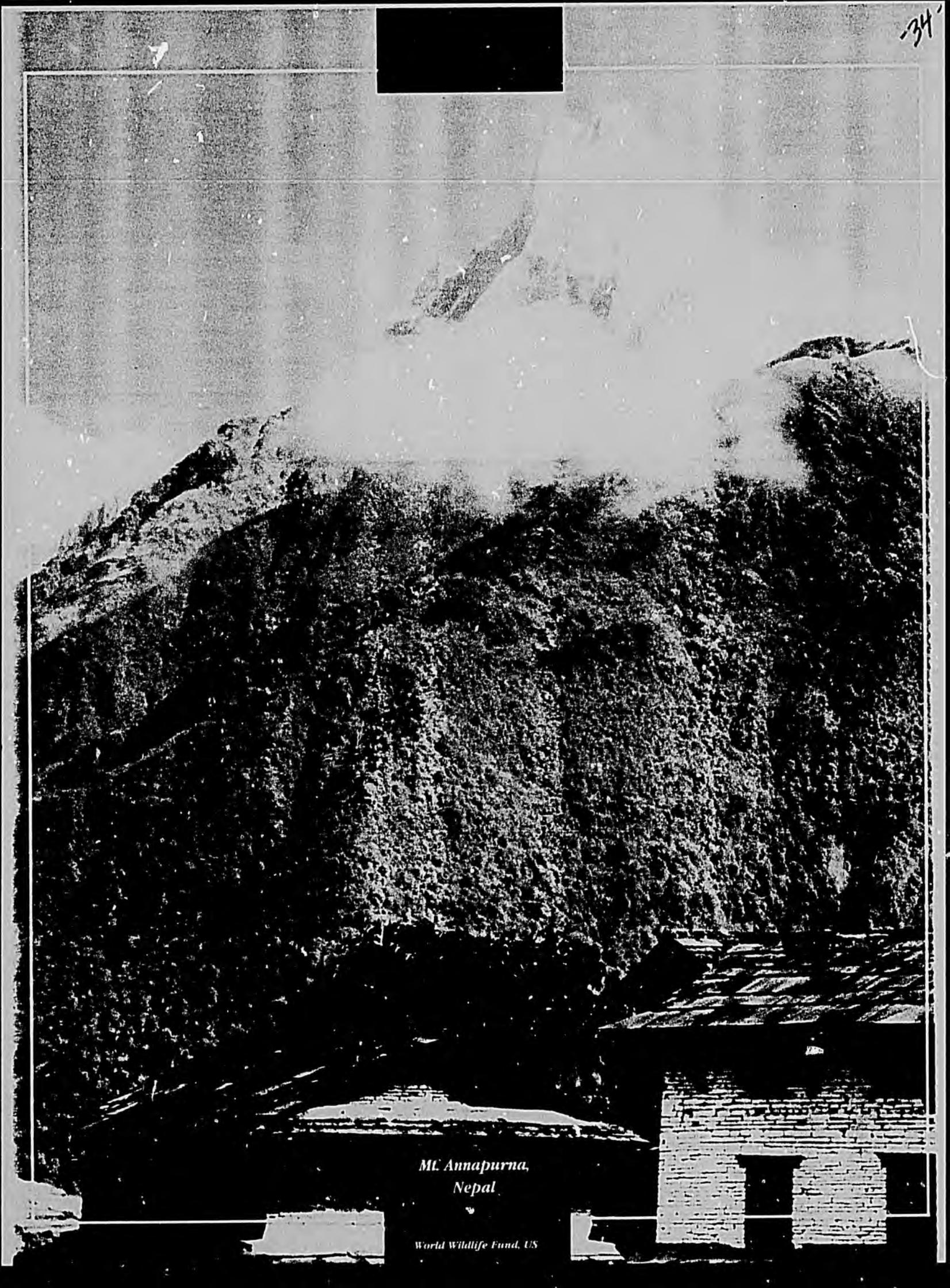
Now the bureau has developed a framework to monitor program impacts. Impact indicators, currently being tested in the field, will measure increases in three key areas: income, agricultural productivity, and the extent of management of important wildland habitats, as well as agricultural resources. Related information is being gathered at five levels:

- Increases in income and/or productivity—such as increases in national or household income—through better management of natural resources;
- Biophysical changes—such as soil fertility, vegetative cover and biodiversity maintained—that increase productivity;
- Adoption of practices that produce biophysical changes, such as the number of community and/or individual initiatives, areas under management, and users who voluntarily adopt improved practices;



- Conditions that lead to the adoption of improved practices, such as public policy revisions that encourage more sustainable natural resource management; and,
- Actions that create the needed conditions, such as USAID-financed inputs and services.

The Bureau for Africa currently is integrating the indicators into the design of field mission bilateral projects. In addition, many promising field level interventions and associated policies have been identified as part of the bureau's natural resource management country assessments in priority countries. The bureau will use the information to design new impact-driven projects and training activities.



*Mc Annapurna,
Nepal*

USAID's Activities in Asia

The destruction of tropical forests and biological diversity has major implications for current and future development in Asia. The region is richly endowed with genetic resources. The moist tropical forests and extensive coral reefs of Southeast Asia are clearly of global significance and provide important sources of income and employment locally.

As populations have increased and urbanization has expanded, demand for products and services from forests and other biological resources has been rising. For example, Thailand, once a major exporter of wood, now imports wood from Burma and Malaysia. The demand for Philippine wood is so great that old growth Dipterocarp forests, the backbone of the Philippine species-rich terrestrial ecosystem, are likely to disappear within seven years at current rates of removal.

Despite solid progress in diversifying its manufacturing sector, Indonesia's economy remains firmly based on natural resource products. The wise management of Indonesia's forest resources is of special significance both to the domestic economy and the region. The country retains 40 percent of Asia's remaining tropical forests. Its forestry sector contributed approximately \$4 billion to 1989 export earnings—the largest non-oil export sector. Improved policies and management practices are needed to sustain output from natural production forests and forest plantations, alike. Greater emphasis also must be placed on improving the management of protection forests and conservation areas through development approaches that enhance economic benefits—without jeopardizing the

conservation of the areas' rich biological assets.

Demand for non-timber forest products remains high in Asia. Half of India's forest revenues are derived from non-timber forest products. Non-timber forest exports from Indonesia total more than \$200 million per year. Thailand now imports non-timber forest products it once exported.

Southeast Asia soon may register the highest species extinction rates in the world as tropical forests become rapidly depleted. Numerous species of birds, invertebrates, reptiles, amphibians, and mammals live in or depend on these rainforests. Already, approximately half the plant species unique to Philippine forests are thought to have become extinct.

Sri Lanka and the South Asian sub-continent—including Bangladesh, India, Nepal, and Pakistan—support a very high number of unique, endemic species in very diverse habitats. While this area once was famed for its extensive jungles, elephants, bears, leopards, primates, and tigers, deforestation has reduced extensive forests to relatively small pockets in all areas (except the tribal areas of the Eastern Himalayas, the Naga Hills, and the Chittagong of India and Bangladesh).

In addition, unique species associated with semi-arid savannahs and species associated with wetlands in the region are at risk because these habitats, like tropical forests, have been degraded by human activities. The sole surviving population of Asiatic lions dwells in an Indian sanctuary. Hundreds of species of migratory birds that fly south from Siberia and northern Asia depend on wetlands in Bangladesh for stop-over; other migratory birds stop over

in wetlands in Pakistan and India. Moreover, the freshwater aquatic and marine diversity of South Asia is poorly documented, but known to be rich.

The principle of conserving this natural resource endowment and managing it in a sustainable way is gaining support from leaders in the countries in the region. New efforts

Approximately half the plant species unique to Philippine forests are thought to have become extinct.

to conserve genetic resources and establish and better manage protected areas are under way. USAID activities in the region support these efforts.

Recent USAID Initiatives

Two major new forestry projects were initiated in Indonesia and Nepal in 1990. They aim to increase those countries' capacity for economic analysis and planning and foster policy change to ensure greater sustainability.

Indonesia. The seven-year, \$18.5 million Natural Resources Management Project is helping strengthen the nation's institutional capacity to identify and analyze natural resource constraints and to address them through improved policy and practices. An inter-agency policy working group—including the ministries of Finance, Forestry, and Home Affairs—will be established to provide overall direction in policy analysis. Areas to be studied include major policy and market failures that result

Focus on The Philippines

Once richly endowed with an abundance of natural resources throughout its numerous islands and coastal waters, the Philippines ranks among the world's top 10 countries in terms of biological diversity. But the country also is facing serious ecological threats and challenges to environment and natural resource management, including rapid population growth, poverty, and unequal distribution of wealth. Deforestation and loss of biological diversity, declining agricultural productivity, overfishing, and the conversion of mangroves testify to the country's resource degradation.

USAID is helping promote economically and ecologically sustainable management of the Philippines' natural resources, focusing particularly on tropical forests and biological diversity. The Agency also is working to increase economic efficiency in the forest products industries. Three recent initiatives support this work.

The Natural Resources Management Program. This five-year, \$125 million program, initiated in 1990, will help facilitate changes in policies that affect the management of the country's natural forests and the efficiency of its forest products industries. The aim is to help the government achieve its objective of sustainable economic growth. The program will support the commitment made by the Philippines to change forestry from a largely exploitative activity to a productive and sustainable operation—one that balances forest production with utilization for economic growth. The program aims to:

- Help stop logging in the remaining primary forests;
- Develop and implement site-specific management plans for the conservation and development of all the nation's natural forests;
- Help empower communities and local governments to take responsibility for protecting and sustainably manag-

ing much of the country's forest estate; and,

- Promote the sale of commercial timber exploitation rights at prices that represent true economic rent; the proceeds are to be invested in sustainable forestry development.

The Rainfed Resources Development Project. This 10-year effort was initiated in 1982 and is now concluding.

The project field-tested "assisted natural regeneration" as a viable means for reforestation. The process protects and supplements naturally occurring tree species, instead of planting new and often exotic tree species. The process not only conserves biological diversity but reduces costs, because the cost per hectare for natural regeneration is lower than reforestation.

The project was established to help identify profitable and sustainable agricultural technologies for rainfed areas and to develop strategies for their dissemination. Early in 1985, the focus was shifted to selecting and adapting technologies, with the goal of expanding them into limited production in 1987. A framework was developed for using private contractors for reforestation—a major innovation in a country where reforestation on public land had been a government activity.

Funding a Filipino Conservation Foundation through a Debt-for-Nature Swap. USAID and the World Wildlife Fund joined forces with the Philippine conservation community in April 1991 to conclude the largest debt-for-



Philippine eagle

nature swap in Asia. The swap will erase as much as \$10 million worth of Philippine debt. The centerpiece of the program will be the creation of a Filipino foundation to direct conservation funds where the monies are most needed. The foundation will be directed by leaders in development, education, health, and conservation drawn from all regions of the Philippines.

USAID will finance the foundation's start-up costs. Funds generated by the debt swap will support its grants budget and operations. The World Wildlife Fund will play an interim technical role, negotiating and facilitating the debt swap, working with Filipino partners to establish the foundation and its board of directors, and managing a small grants program that will operate until the foundation is fully operational.

in depletion of natural resources, and natural resources accounting methods in national income accounting. A comparison will be made of natural forest management and plantation forestry. In addition, a national strategy to develop marine-based tourism will be examined.

To complement such policy aspects, the project supports a pilot effort to manage natural forests and protected areas. Executed through a cooperative program with a forest concessionaire, this component will strengthen the Ministry of Forestry's capability to manage natural production forests for sustained yields. Emphasis will be placed on planning and implementing viable multi-purpose management approaches for selected protected areas. In addition, support will be given to applied research aimed at addressing priority management needs for natural production forests and protected areas.

A field research and training station will be established on the Sari Bumi Kusuma forest concession. Pilot management activities also will be conducted in the Bukit Baka Reserve and Gunung Palung National Park in West Kalimantan, as well as the Bunaken Marine National Park in northern Sulawesi.

Nepal. USAID's \$9 million Forestry Development Project aims to strengthen the capability of the Ministry of Forests and Soil Conservation to increase the productivity and sustainability of forest production systems. The project will emphasize the implementation of Nepal's Master Plan for the Forestry Sector, which is based on the premise that local communities, rather than the government, will manage the majority of the 5.6 million hectares of remaining forest land.

In addition to these forestry projects, USAID launched two major efforts in the South Pacific in 1991



Illustration: New Tree (Acacia/Indigo) © Peggy F. ...

Peggy Drake

Neem tree

that will help conserve natural ecosystems.

The South Pacific: The Profitable Environmental Protection (PEP) Project. The PEP Project aims to facilitate long-term conservation of ecosystems in the region that are biologically and economically viable. It encourages commercial and community enterprises that are both profitable and environmentally sustainable. The three-year, \$2.4 million project was initiated in 1991.

The effort will identify ecological management units where habitats needing protection and human communities concerned about their environment co-exist. Working models and profitable enterprises that protect the environment in these habitats will be established. It is expected that the project will show that enterprises that are ecologically benign also can be profitable, thereby integrating development with nature conservation. The project will begin in Vanuatu and progressively expand to three other South Pacific nations.

The South Pacific: Strengthening NGOs. The Forestry Support Program/NGO Consortium Building Project for Sustainable Forestry Development was initiated in 1991. The five-year project aims to enable the Foundation for the Peoples of the

South Pacific to strengthen a consortium of NGOs in Papua New Guinea, the Solomon Islands, and Vanuatu. The organizations seek to save rainforests while increasing villager income earned through microenterprises associated with portable sawmilling.

Ongoing USAID Activities

Nepal: The Institute of Forestry Project. Yale University's School of Forestry and Environmental Studies has made progress since 1987 in the five-year, \$8.7 million USAID-supported Nepal Institute of Forestry project. Working through the Washington, D.C.-based International Resources Group, the project is improving the institute's capability to meet the demand for professionally trained resource managers. The Institute of Forestry, part of Nepal's national university system, is the country's major training ground for the professional skills needed to address Nepal's pressing resource management issues. The project provides technical assistance, training, and other institutional support to enhance the institute's teaching, research, and extension efforts. The institute's curriculum is being revised to better support the social forestry orientation of Nepal's Master Plan for the Forestry Sector.

Curriculum revision was the focus of a major workshop held at the institute in November 1990. Efforts are under way to install a computerized cataloging system in the institute's library; this would interface with the Forestry Research Division Library at the Ministry of Forests in Kathmandu, as well as other resource centers in Nepal and abroad.

The Himalayas: Protecting the Mt. Everest Region. In an area globally recognized for its rich biological diversity, USAID is helping develop a new nature preserve. The Makalu Barun Conservation project centers



Waters & International

on Nepal's 40,000-square-kilometer Makalu Barun National Park and Conservation Area, which lies largely in the watershed of the upper Arun River on the eastern flanks of Mt. Everest. It adjoins Sagarmatha National Park, Langtang National Park, and the Qomolangma Nature Preserve in the Tibet Autonomous Region of China. The area contains a wide range of ecological zones, ranging from tropical forests to the perennial snows of the high Himalayas.

The project emphasizes local participation in all phases of planning and management and the integration of local cultural practices with scientific management strategies. An overall management plan to conserve the Makalu Barun area was completed and submitted to the government of Nepal in 1990.

Thailand: Managing Thai Parks and Sanctuaries. The capacity of Thailand's Royal Forest Department to manage national parks and sanctuaries has been strengthened through a six-year, \$44 million effort, the Management of Natural Resources and Environment for Sustainable Development (MANRES) project. The effort has supported several biological diversity conservation activities, including the development of a national assessment of botanical research needs, a publication on Thailand's endangered fauna, and a tour of U.S. zoological parks by Thai zoologists.

Indonesia: Promoting NGOs and Biological Diversity. In Indonesia, the USAID mission continues to support the efforts of an NGO, the Indonesia Environment Forum

*Harvesting green fodder from
Leucaena sapling*

(WALHD), to develop a biological diversity program managed by non-governmental organizations. In the last three years, more than 20 separate activities have been supported, including publication of a quarterly biological diversity bulletin; a study of traditional coastal land and fishing rights; a community seed bank; and the development of a marine reserve management plan. The effort is supported through the PVO Co-Financing Project.

South and Southeast Asia: Wildlife Management Training. To help address the need for field-trained conservation workers in South and Southeast Asia, USAID and the World Wildlife Fund (WWF) support the development of a wildlife management training facility, the Nepal Conservation Training and Research Institute (NECTARI). In 1989, USAID and WWF collaborated in conducting a feasibility study to determine the needs and most appropriate site for the facility.

The Sauraha Field Station in Royal Chitwan National Park was selected as the appropriate site. Field training courses began in 1990.

Long-term research on the park's large-mammal populations—including the tiger and greater one-horned rhinoceros—figures prominently in course work at NECTARI. Trainees participate directly in the ongoing monitoring of mammals. The project also provides funds to renovate the

existing buildings at the field station, as well as to cover staff expenses and scholarships for participants to attend courses. In addition to offering training courses for residents of the region, the field station will be used for research by graduate students from Nepal and other countries.

Pakistan: Tree Planting and Production. The seven-year Pakistan Forestry Planning and Development Project, which concluded in 1990, has expanded tree planting and production in Pakistan to supply fuel, fodder, and timber for domestic use. USAID contributed \$35 million to the project, whose main goal was to help Pakistan achieve rural energy self-sufficiency. The project also aimed to expand tree planting and production, especially by emphasizing farm forestry on private land. At the same time, the project was intended to strengthen the government's ability to carry out successful public and private forest management programs. The project's achievements included:

- Training and advising more than 1,700 farmers on how to operate tree-seedling nurseries. These farmers have produced and sold more than 72 million trees for planting on nearly 59,000 Pakistani farms;
- Helping farmers develop nearly 14,000 acres of marginal lands for tree planting and establishing special soil-conserving practices on nearly 1,100 acres;
- Helping scientists initiate more than 50 forest research studies at field stations and farm sites;

- Rehabilitating 285 acres of irrigated forest plantations in Sindh province;

- Providing master's degree fellowships for six foresters at universities outside Pakistan and short-term training overseas for more than 100 foresters and farmers;

- Designing and implementing undergraduate and graduate-level curricula at the Pakistan Forest Institute. The second class, which included four women, was graduated in October 1990;

- Providing in-country training for more than 400 foresters. Twenty-two graduates earned Master of Science degrees and 28 earned Bachelor of Science degrees at the Pakistan Forest Institute. More than 350 students participated in short courses;

- Conducting socio-anthropological studies of 118 rural villages to guide the development of farm-forestry policies and priorities;

- Completing 13 market sector studies, conducted by Pakistani consultants and faculty and students from the Pakistan Forest Institute; and,

- Sponsoring two international symposia and publishing the proceedings. One focused on forest policy issues and the other examined the linkage of wood producers, wood users, and professional foresters with private-sector development.



*Rainforest
floor*

USAID's Activities in Latin America and the Caribbean

Forests cover about one-third of the total area of Latin America and the Caribbean and contribute significant economic benefits to the region's people. The export of forest products has become an increasingly important source of foreign exchange, particularly in Brazil, Chile, Honduras, and Paraguay.

The region also is very rich in species; it contains about two-fifths of the plant and animal species of the world's tropical forests. Biological diversity is particularly great in the region's rainforests, but also abounds in coral reefs. Mangroves and wetlands provide unique habitats for migratory species, as well as spawning and rearing grounds for fish and crustaceans. Many of the wild species related to the world's major food crops—including corn, tomatoes, plantains, and cacao—come from Latin American forests. Such genetic diversity is crucial to sustaining world agriculture in the future.

The rate of deforestation in Latin America is among the highest in the developing world: about 1.3 percent of the existing forests are lost annually—a rate nearly 50 percent greater than Asia's and more than twice that of Africa. Reforestation efforts are insufficient to offset losses. At least 10 hectares are being removed for each hectare reforested. Moreover, this loss of forests threatens the region's rich flora and fauna, causing a further loss of biodiversity.

Many causes contribute to deforestation and biodiversity loss, including policies that fail to recognize the value of forests and encourage their conversion to unsustainable

pastureland and agriculture. In Mexico, for example, most deforestation takes place to create pastures to support beef cattle. Similarly, nearly two-thirds of the deforestation in the Amazon Basin since 1960 occurred to make way for pastures controlled by large ranchers and land speculators. Government subsidies, often augmented in the past by support from international agencies, have contributed to deforestation in the basin, as have commercial logging, mining, land speculation, and the expansion of commercial plantation crops.

The need for sustainable natural resource management in the region is urgent. In Central America, for example, 40 percent of the forest cover has been cut since 1950; in some areas, 90 percent of that wood has been either burned or left to rot. Such mismanagement has already destroyed watersheds, impoverished biological diversity, increased river sediment loads, shortened the life of reservoirs for hydroelectricity and potable water, and upset the ecological balance of coastal areas.

The challenges that face Latin America and the Caribbean as a whole are complex: to reverse natural resource degradation; overcome inequities that exacerbate these problems; incorporate conservation into development; and realize the multi-faceted economic benefits of such changes. To meet these challenges, it is important to involve local communities and industries fully in resource management and development efforts; these,



Newly hatched sea turtle

in turn, can help generate jobs and ensure that benefits accrue to local economies. Clearly, a comprehensive and cross-cutting approach is needed.

USAID addresses these issues in the region through a broad strategy that includes natural forest management; comprehensive watershed management; developing extractive reserves that use forests productively in sustainable ways; and establishing protected forest areas that have economic, as well as environmental, benefits. Reforestation efforts emphasize native species to serve multiple economic, ecological and social purposes. The Agency stresses a key element of improving forest management in the region—reforming forest ownership laws and land titling.

To these ends, USAID emphasizes

Protecting Parks in Peril

Hundreds of critically threatened ecosystems in Latin America and the Caribbean could benefit from better on-site management through a program designed by The Nature Conservancy and funded by USAID.

The program, the Parks in Peril Project, was launched in 1990 to ensure adequate on-site protection for threatened national parks and reserves in the area that have global biological importance. The project works as a partner with indigenous NGOs and government agencies to establish a permanent management presence in each protected area. Specifically, the program focuses on surveying protected area boundaries; recruiting, training and equipping rangers and communities; developing park infrastructure; and promoting local community participation in park management activities.

The \$5.9 million project will establish on-site management over a four-year period for as many as 30 priority parks. The first 10 parks now receiving assistance are:

Country	Park
Bolivia	<i>Amboro National Park</i> <i>Noel Kempff Mercado National Park</i>
Colombia	<i>La Paya National Park</i>
Costa Rica	<i>Corcovado National Park</i>
Domin. Rep.	<i>Jaragua National Park</i>
Guatemala	<i>Sierra de las Minas Biosphere Reserve</i>
Mexico	<i>El Triunfo Ecological Reserve</i> <i>Río Lagartos/Río Celestun Wildlife Refuge</i>
Panama	<i>Darien Biosphere Reserve</i>
Peru	<i>Pampas del Heath National Sanctuary</i>

Significant progress has been achieved in the program's first year:

- Work plans and budgets for the first 10 high-priority Parks in Peril sites

have been approved. On-the-ground protection and management activities are under way;

- Thirty-seven representatives from NGOs and government agencies participated in a weeklong training program in Panama. Five representatives of NGOs participated in a "Wildlands Management Course" at Colorado State University in July and August 1991. More than 50 rangers and extensionists received training; and,

- The collection of biological and economic baseline data is providing insights on the solutions to key biodiversity conservation issues for each Parks in Peril site. Local conservation data centers are actively involved in this effort.

In specific parks, a wide range of activities are under way. For example, in Bolivia's Amboro National Park, the Fondo Nacional para el Medio Ambiente (FONAMA) has created a trust fund that will enable the Fundación Amigos de la Naturaleza (FAN)—a local NGO responsible for protecting the park's southern and western limits—to count on locally generated income.

In Costa Rica, a 12,000-hectare area was added to Corcovado National Park, part of the Osa Conservation Area. Fundación Neotrópica, a private organization, has set up the Osa Rainforest Fund—an endowment fund to sustain conservation activities in the area over the long term. Already, the Chiriquo Rainforest Action Group has contributed to this fund.

Efforts also are under way to protect Guatemala's Sierra de las Minas Biosphere Reserve, which is located on the oldest mountain range in Central



Lorenzo Insuasti, Fundación Amigos de la Naturaleza

Noel Kempff Mercado National Park, Bolivia

America—an area of abundant biological diversity with an unusually high rate of endemic species. The reserve protects habitat for endangered telines and monkeys, as well as more than 400 species of birds, including the quetzal and harpy eagle. The area is threatened by timber concessions and uncontrolled agricultural expansion.

Defensores de la Naturaleza, a local NGO, is co-managing this Parks in Peril site with its government partner, the Consejo Nacional Para Areas Protegidas (CONAP), a public-private partnership unique to Latin America. Defensores has acquired more than 30,000 acres of ecologically sensitive properties with Nature Conservancy support. Defensores also has engaged the World Wildlife Fund and CARE to help focus on sustainable development in the reserve's northern buffer zone.

policy reform and improved land-use planning. A particularly important consideration is empowering resource users and communities in management decisions—a step that recognizes the estimated 10 million indigenous and 200 million highly disadvantaged people who live in rural areas in the region.

Recent USAID Initiatives

A number of new projects were initiated in the region in 1990-1991.

The Environmental Support Project. The six-year, \$12.3 million project was initiated in 1990 with a two-part goal: to promote the improved management and conservation of natural resources in Latin America and the Caribbean, while complementing and sustaining economic development programs. USAID awarded six grants in 1990 and 1991:

- In Bolivia's Departamento de Santa Cruz, the New York Botanical Garden is conducting a botanical inventory of the Amboro and Noel Kempff Mercado National Parks. Both parks are designated sites under the Parks in Peril Project. The botanical inventory will determine diversity within the vegetation types of each park and will show which areas of the parks are most environmentally threatened and fragile.

- In Amazonian Ecuador, the New York Botanical Garden also is conducting biological and economic studies to support the development of extractive reserves. Extraction of renewable forest products offers sustainable, ecologically viable, and economic alternatives to timber harvesting and cattle ranching in the lowland tropics. Participants will work closely with the indigenous Waorani, Shuar, and Quichua people to glean information about useful plant species. Other topics to be examined include the market value of extractable products; the value of subsis-

tence products that do not enter the cash economy; and the effects of extraction on the reproduction and establishment of economic species.

- In Central America, the Wildlife Preservation Trust received support to conduct a zoo biology and captive breeding management course to improve the standard of animal management in the region's zoological gardens. The two-week course was conducted in February 1990 in Guatemala's La Aurora Zoo and included representatives from major zoos in every country in Central America.

- In Guatemala, Conservation International is working to describe and propose legal boundaries for eight priority biodiversity and tropical forest areas, which contain the country's only true lowland tropical rainforest, as well as important wetland and coastal ecosystems. By describing legal boundaries and preparing proper management categories and plans for these areas, the project will advance the conservation of Guatemala's biodiversity.

- On northeastern Nicaragua's Miskito Coast, the Caribbean Conservation Corporation is helping to establish a protected area—one of the biologically richest coastal marine areas of comparable size in tropical America. The area is occupied and governed by the Miskito people, the country's largest indigenous group. Establishing a Miskito Coast Protected Area is among the top priorities of the Nicaraguan Institute of Natural Resources and Environment and an effort strongly supported by Miskito local communities.

The protected area will preserve diverse and ecologically significant ecosystems and genetically important populations of terrestrial, aquatic, and marine organisms. Unregulated legal and illegal fisheries will be controlled and economic opportunities and alternatives for Miskito coastal communities will be created through sustainable resource management.

The Caribbean Conservation Foundation is working closely with MIKUPIA, an indigenous Miskito NGO, to develop and implement the management plan for the area.

- In Bolivia's lowland tropical forests, the Wilderness Society is developing a biological and economic analysis of sustainable selective logging. The project will develop an

Extraction of renewable forest products offers sustainable, ecologically viable, and economic alternatives to timber harvesting and cattle ranching in the lowland tropics.

ecological basis for long-term sustainable harvest of mahogany; examine the degree to which current timber policies in Bolivia encourage unsustainable logging; and suggest viable alternative pricing systems that will increase government revenues and reduce environmental damage to the forest. A package of educational materials based on the study will be developed to help train Latin American conservation professionals, in conjunction with the Smithsonian Institution's annual conservation training workshop in Bolivia. The project also is likely to fund special studies that contribute to the understanding of environmental and natural resource issues in economic development.

The Eastern Caribbean: The Environment and Coastal Resource (ENCORE) Management Project.

The ENCORE project focuses on the eight island countries 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. The effort was initiated in 1991 to demonstrate on a regional

basis that partnerships among public, private, and community interests can conserve the area's resource base.

The project will focus on environmental public awareness and education, training, policy dialogue, and environmental monitoring. A local site-management component will demonstrate the advantages of community and governmental partnerships in managing natural resources for long-term sustainable economic growth. Local communities will participate in all stages of project development and implementation.

Nicaragua: The Natural Resources Management Project. The \$9 million project, launched in 1991, seeks to support natural resource conservation and management in Nicaragua. In particular, the effort will strengthen the Nicaragua Institute for Natural Resources and Environment (IRENA), the primary agency for scientific investigation, policy formulation, regulation, and oversight. The agency was essentially dismantled under the former Sandinista government.

The project will strengthen IRENA's capacity to conduct natural resource policy analyses. In addition, the effort will help the institute expand its current focus on forest and land-use planning to include overall environmental quality regulation. A Conservation Information Center will be established within IRENA to provide needed data on resources and biological diversity in Nicaragua's tropical forests and wildlands.

The project will establish up to three protected areas as fully operational reserves with functioning natural resource programs. In conjunction with management plans for each reserve, surrounding areas will be included in the management system to help meet the immediate needs of local inhabitants.



Hilfswald/Watson/1991

Byrsonima crassifolia is used for firewood and charcoal.

Panama: The Natural Resources Management Project (MARENA).

This seven-year, \$18 million effort was authorized in 1991 to help the government of Panama protect and manage the country's renewable natural resources—particularly the Panama Canal watershed—by providing technical assistance, training, commodities, and construction costs. The planning, land use, and management capabilities of the National Institute for Renewable Natural Resources (INRENARE) will be strengthened. In addition, the management of Panama's parks will be improved. A natural resource conservation foundation will be established with a trust fund capitalized by a debt-for-nature swap.

Guatemala: The Maya Biosphere Reserve Project.

This effort aims to improve the management of renewable natural resources and protection of biodiversity and tropical forests in the Maya Biosphere Reserve. The 1.5 million-hectare area is located in Guatemala's northernmost department—the Peten. While one of the country's poorest areas, it holds great potential because of its wealth of natural resources, including valuable tropical hardwoods and important extractive mineral reserves.

The \$10.5 million effort was initiated in August 1990. An additional

\$2.9 million was provided by participating NGOs, including Conservation International, The Nature Conservancy, CARE, and the Rodale Institute.

The Nature Conservancy began activities related to the institutional strengthening and administration of the project in 1991 and will help develop a master plan for the reserve. Conservation International will focus on sustainable resource management activities, including the promotion of small-scale community-based economic activities aimed at the sustainable, managed use of renewable forest products. CARE will provide community extension and education services through a cooperative agreement signed with USAID in October 1991. Through a similar agreement, the Rodale Institute will help develop an agroforestry research and extension center for a buffer zone south of the reserve.

A study investigating social and environmental aspects of slash-and-burn cultivation by selected communities within the Biosphere Reserve was completed in September 1991. It provided a practical demonstration of the effectiveness of using fire breaks to prevent unnecessary damage to forests during burning. Moreover, the study forged links with communities that can be utilized later in the project.

An anthropological study of ancient Mayan farming practices was under way. Scientists are examining the possibility of applying long-forgotten agricultural methods to modern environmental problems.

The Biosphere Reserve's many archaeological sites not only provide data for the reconstruction of such helpful technologies, but also could serve as important tourist attractions. Thus, the project is examining means to develop profitable ecotourism.

Among the project's recent achievements has been the placement of 150 staff members of Guatemala's National Council of Protected Areas (CONAP) in the Peten. The staff presence has significantly reduced and even reversed spontaneous colonization in some areas. CONAP also has initiated an environmental awareness campaign, using radio spots, schools, and community meetings.

Ecuador: The Sustainable Uses for Biological Resources (SUBIR) Project. The six-year, \$9 million effort was authorized in 1991 to help conserve and manage Ecuador's natural resources for economic development. The project aims to develop the economic potential of natural areas and their buffer zones in selected areas. In addition, it seeks to preserve biodiversity and improve the economic well-being of local communities through their participation in natural resource management activities.

The three protected areas involved are Cotacachi-Cayapas Ecological Reserve, Cayambe-Coca Ecological Reserve, and Yasuni National Park. Pilot projects in these areas will strengthen local community organizations and NGOs; promote the management of protected areas to maintain ecosystems and provide economic benefits to buffer zones; develop ecotourism; and perform research and monitor project activities to gather information to develop protected area management plans. In addition, the effort will improve use of land and biological resources to increase the productivity of existing resource practices and diversify economic activities.

Conserving Neotropical Migratory Birds

Each year throughout the United States, the transit of birds to and from their winter habitats in Mexico, the Caribbean, and Central and South America is a familiar and welcome sight. But long-term observations point to troublesome declines in the populations of many species of "neotropical" migratory birds. Such migrants make up nearly one-quarter of U.S. bird species, including such well-known species as the bobolink, the broad-winged hawk, the northern (Baltimore) oriole, the rose-breasted grosbeak, the ruby-throated hummingbird, the scarlet tanager, the wood thrush and many warblers, as well as other forest and grassland birds.

In some states, more than 70 percent of neotropical bird species suffered declines in populations from 1980 to 1989, according to the U.S. Department of the Interior (USDI) Fish and Wildlife Service's Breeding Bird Survey. In the eastern United States, 44 of 62 neotropical species declined from 1978 to 1987.

The species that appear to be declining most seriously are those that both breed and winter in forested habitats. Neotropical birds are particularly vulnerable to deforestation and other habitat changes in Latin America and the Caribbean islands because they often winter in small geographic areas.

Two factors may explain declines in neotropical migratory birds: forest fragmentation—replacement of large blocks of natural forest with smaller patches of younger forest—in the United States; and loss of wintering habitats in Mexico, the Caribbean, and Central and South America.

The Neotropical Migratory Bird Conservation Program was initiated to develop a framework to address the long-term conservation needs of migratory birds. The program will include data sharing, international coordination, research, and public education. It is a



comprehensive, cooperative effort involving partnerships among federal, state, and local agencies, as well as non-governmental organizations and the private sector.

A memorandum of agreement establishing the program was signed in May 1991 by seven U.S. federal agencies: the Department of the Navy; USAID; the USDA Forest Service; the USDI Bureau of Land Management; the USDI Fish and Wildlife Service; the USDI Park Service; and the U.S. Environmental Protection Agency.

In 1991, USAID provided the National Fish and Wildlife Foundation, a Washington, DC based non-profit organization, with a \$500,000 grant to establish a neotropical migratory birds project. This effort aims to improve and coordinate monitoring, research, and related training, and education programs that address the decline in neotropical migratory bird populations. The project will provide grants to NGOs, government agencies, and independent researchers.

Dr. Joseph Wunderle, USDA Forest Service, conducts a bird banding workshop on St. Lucia, West Indies.



Local citizens gather for an environmental workshop in Costa Rica.

World Wildlife Fund, Inc.

Ongoing USAID Activities

Central America: The Regional Environmental and Natural Resources Management (RENARM) Project. The \$16 million RENARM effort responds directly to the urgent need for sustainable natural resource management in Central America. The project is expected to catalyze government and other donor support to arrest and reverse the rapid deterioration of the region's natural resource base to assure continued economic growth during the coming decades. The six-year effort was authorized in August 1989.

A policy inventory has been conducted to identify existing legislation, regulations, and administrative policies that affect the natural resource base for all Central American

countries. Critical policy concerns examined include colonization policies; export incentives for both traditional and non-traditional crops; regulatory and environmental policies for new industries; and policies regulating land, water use, forest management, and pesticides.

In the last two years, RENARM has funded a number of resource management workshops. Among these was the Coastal Resource Management Workshop held in Guatemala in September 1991. The meeting identified coastal resource management priorities meriting regional attention. Representatives of a wide range of public and private groups with an interest or expertise in the field attended.

A RENARM-funded training course on the captive breeding of endangered species was presented by the Wildlife Preservation Trust. Thirty-

two technicians representing 19 regional institutions participated.

Costa Rica: The Forest Resources for a Sustainable Environment (FORESTA) Project. This effort will promote sustainable production from natural forest buffer zones around natural areas of the Central Cordillera, including the Braulio Carrillo, Poas, and Irazú National Parks. The project aims to support protected area management and develop forestry and agroforestry in the buffer zones around those areas. The seven-year, \$7.5 million project was initiated in 1989 and is being implemented by a local foundation, Fundación para el Desarrollo de la Cordillera Central Volcánica.

At least 5,000 hectares will be managed according to officially approved plans. An integrated forest industry with access to a sustainable

supply of raw materials will be opened; no encroachment on park land will be permitted. Assistance also will be provided to area residents to plant trees on their farms, thereby increasing their income and improving their land.

A strategy for the conservation area is being prepared, and parks infrastructure improvements are well under way. Data collection for baseline information has been initiated. A nursery has been established. Four contracts have been issued for community residents of buffer zones to provide for park-related services. Forestry management plans are being prepared for reforesting more than 800 hectares.

Costa Rica: The Forest Conservation and Management Project (BOSCOSA). This project is helping to conserve a national park by helping surrounding communities create a buffer zone and improve the use of their land. The project, initiated in 1987, focuses on the Golfo Dulce Forest Reserve, which forms a buffer zone around the Corcovado National Park. The effort is designing and demonstrating an economically and environmentally viable forest management system using agroforestry and natural forest management techniques. Implemented jointly by the Conservation Foundation, the World Wildlife Fund, and the Fundación Neotropica, a Costa Rican NGO, the project assists local communities in agriculture, forest management, wood processing, and community development, while supporting government efforts to develop forest management plans.

Land-use surveys are being conducted, and land tenure issues are in the process of being resolved. In 1991, more than 170 hectares of land were expected to be reforested. Assistance

communities produce wooden handicrafts to boost incomes. In addition, a geographic information system (GIS) has been established—part of a longer term effort to organize a forestry data bank.

In 1991, a para-foresters training project was initiated with financing from the World Wildlife Fund and the USDA Forest Service. Twelve trainees were selected from local NGOs to receive hands-on training. Training modules currently being developed focus on such issues as resource recognition and evaluation, tropical forest ecology, forestry extension, natural rainforest management, and agroforestry systems.

Honduras: The Forestry Development Project. This six-year, \$20 million effort, initiated in 1988, focuses on reforming policy, strengthening a public forest management organization and enhancing the efficiency of wood-product processing and marketing. The results have been encouraging.

The project helps the Honduran Forest Development Corporation (COHDEFOR) improve management practices and operating procedures. For the first time, COHDEFOR—the main public sector institution responsible for forest management—has included the private sector as a participant in marketing and divesting its industries. This new arrangement will enable COHDEFOR to focus primarily on managing forestry resources.

La Unión was the site of a pilot program. The La Unión Forest Management Area, a 100,000-hectare unit in the central portion of the country, was established; a forestry management plan already has been developed. A system including fire protec-

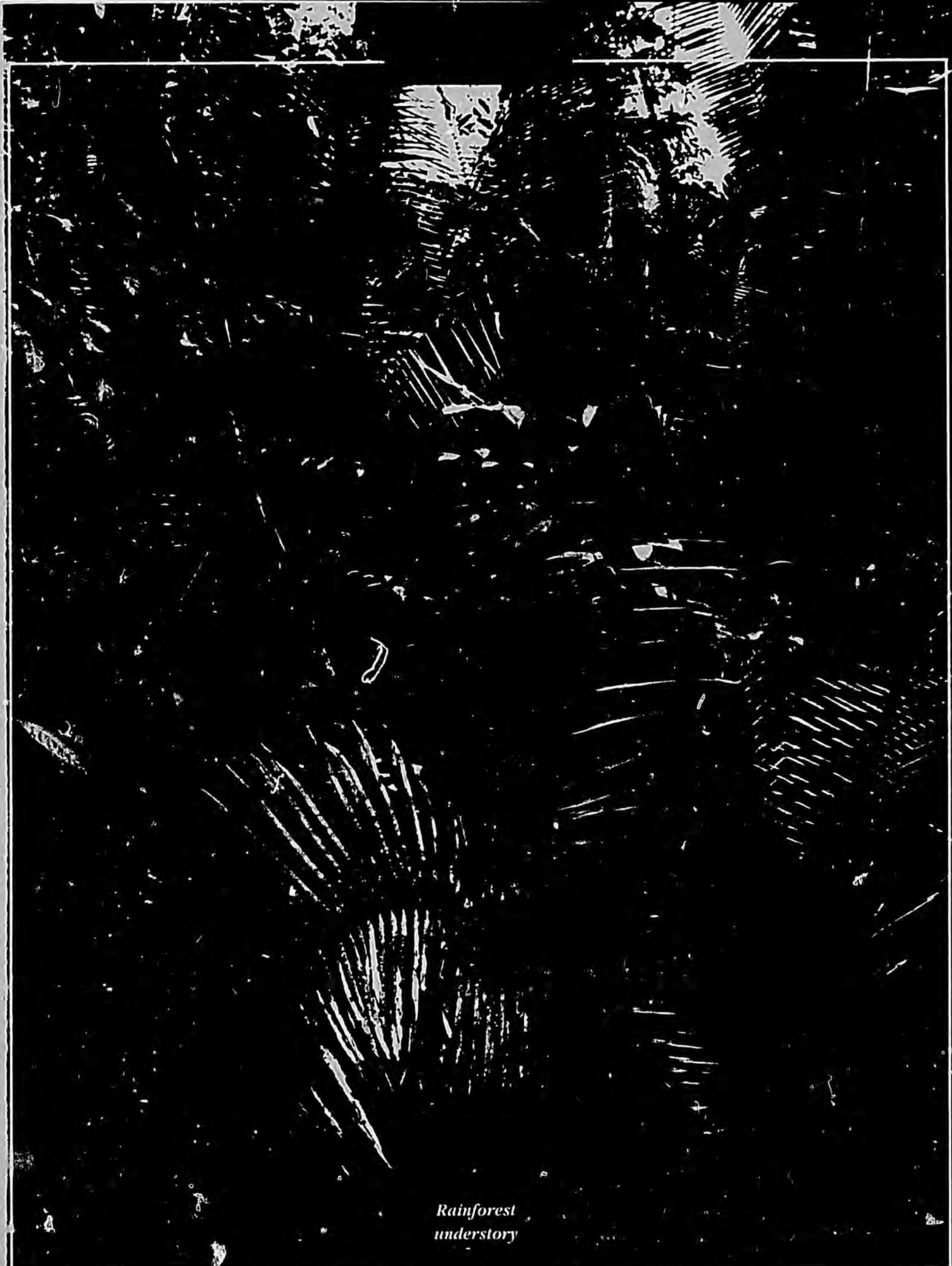
tion, wildlife management, protected forest areas, integrated pest management, soil conservation, range management, and agroforestry practices is being put into place. The local population is expected to derive significant, sustained income from forest-based industries and activities. The

The BOSCOSA project is designing an economically and environmentally viable forest management system using agroforestry and natural forest management techniques.

pilot program will soon be replicated in a second area.

A new timber sale procedure has been developed for all commercial pine lumber transactions. All lumber exports will be handled and negotiated by the private sector; the national government will receive an appropriate sales commission. The management unit at La Unión has adopted the new procedure, as well as a newly designed timber sale contract similar to one used by the USDA Forest Service. A major training program has been conducted so that a timber sales preparation and administration system could be expanded nationwide.

The project is a collaborative effort involving USAID, COHDEFOR, and two branches of the U.S. Department of Agriculture—the Office of International Cooperation and Development (OICD) and the Forest Service. The Honduras National Forestry School (ESNACIFOR), which trains forest technicians, is part of the field operations. The Honduras Lumbermen's Association, AMADHO, also receives support for training.



*Rainforest
understory*

Development Projects

Referenced in this 1990-1991 Report to Congress

Project Title Project Number	USAID Country or Bureau	Primary Implementing Organization	Funding Years	Total Authorized LOP (\$000's)	Predominant Conservation Activity
WORLDWIDE PROJECTS					
Conservation of Biological Diversity 936-5554	Science and Technology	World Wildlife Fund	88-97	20,000	This project promotes the conservation of biological diversity in USAID and LDC programs worldwide. It provides assistance to prepare national and local conservation strategies and programs, design research proposals, and survey ecosystems; and matching grants to fund studies on ecological, sociopolitical, and economic issues related to conservation. It supports training of LDC scientists to help them better formulate R&D proposals and take advantage of existing funding sources; information dissemination and networking to link databases and to sponsor outreach efforts such as literature reviews and technical seminars; and pilot field demonstrations including conservation education and conservation data centers.
Forest Resources Management 936-5519	Science and Technology	US Forest Service	80-90	19,821	The project funded the Forestry Support Program (FSP), which provides AID/W and field missions with technical advice in tropical forestry and natural resources (fuelwood, natural woodlands, agroforestry, reforestation, community resource use) and locates long-term staff and short-term consultants for AID or cooperative AID, Peace Corps projects. It also funded a joint AID/Peace Corps forestry initiative, which provides technical programming and back-stopping expertise to Peace Corps and develops collaborative community-based forestry projects that can be staffed by Peace Corps volunteers.
Forest Resources Management II 936-5556	Science and Technology	US Forest Service	91-99	25,000	This project is a renewal of the Forest Resource Management Project (936-5519). It continues funding of the Forestry Support Program and support to the U.S. Peace Corps forestry volunteers activities. The project supports LDC forestry institution building, research, mobilization of LDC and U.S. private industry and university capabilities for advancing LDC forestry-based economic development objectives, yearly training workshops, building and strengthening cooperative relationships between forestry and agriculture, LDC efforts to meet energy and fuelwood needs through forestry, and research into such areas as forestry's relationship to housing and agribusiness and the private sector's role in tree improvement and forestation.
Coastal Resources Management 936-5518	Science and Technology	Univ. of Rhode Island	88-95	13,800	The project provides assistance, training, and research in order to increase the capacity of LDC professionals and institutions to identify and resolve multi-sectoral problems of coastal areas. Three pilot projects have been undertaken in Ecuador, Sri Lanka, and Thailand. They have been instrumental in the development of coastal zone management programs involving mangrove and coral reef conservation.

Project Title Project Number	USAID Country or Bureau	Primary Implementing Organization	Funding Years	Total Authorized LOP (\$000's)	Predominant Conservation Activity
Development Strategies for Fragile Lands (DEFIL) 936-5438	Science and Technology RD	Chemonics with Abt Associates, Rodale Institute and Datex Inc.	86-96	6,100	In its first five years this project helped USAID missions in the Latin American and Caribbean region to develop improved strategies for forested lowlands and sloping lands, classed as fragile lands (FL) in Latin America and the Caribbean by means of workshops, special assessments for mission FL strategies; assessments to develop host country FL strategies; and studies or research to resolve specific program and project problems for missions and countries. In the second five years the project will support USAID missions in other regions. The project uses a multi-disciplinary approach to address the major themes of policy strategy, institutional arrangements, technology diffusion and development, and farmer incentive systems.
CA					
Natural Resources Management Support Project 698-0467	Africa Regional	Initially, International Resources Group. Second phase: Amex, Inc.	87-92	28,370	The project is designed as the Bureau's vehicle for systematic support to improve policies and programs and to restore and maintain environmental stability and the natural resources base in sub-Saharan Africa, especially in agriculture. The project addresses its goals by: (1) assisting missions to conduct natural resources management (NRM) program assessments; (2) providing missions with consulting assistance in designing, implementing and evaluating NRM projects; (3) sponsoring and funding special studies to assist the bureau, REDSO and missions in their NRM programming and implementation; (4) publishing a newsletter and examining mission and REDSO information needs in NRM; (5) helping PVOs strengthen their capabilities in NRM through training, technical assistance and information support; and (6) providing support for biological diversity.
Sustainable Approaches to Viable Environmental Management (SAVEM) 687-0110	Madagascar	PACT, Tropical Research and Development, Inc.	90-94	26,600	This project will (1) establish a solid base for implementation of the environment action program in Madagascar with particular emphasis on the development of human resources, institutional strengthening, procedures for filtering investments, assessing environmental impact, and upgrading the tools for the environmental management such as cartography, satellite imagery analysis, and project monitoring; and (2) launch operations for the protection and management of biodiversity and the fight against soil erosion.
Senegal Reforestation Project 685-0283	Senegal	Winrock International	86-91	12,000	(Former title: Reforestation And Soil Conservation) The purpose of the project is to "mobilize large-scale popular participation in tree planting with local and private resources." In the first two years of field work, over 700 individuals and groups planted 2500 acres of trees with co-financing from the project. Municipalities, using private contractors, have completed 20 miles of roadside plantings. New commercial opportunities involving forestry products have been identified as part of a strategy of increasing private sector demand for wood, lumber, and other tree products.

Project Title Project Number	USAID Country or Bureau	Primary Implementing Organization	Funding Years	Total Authorized LOP(\$000's)	Predominant Conservation Activity
Action Program for the Environment 017-0123	Uganda	(not determined as of 3/31/92)	91-94	10,000	This project will support the development of a sustainable natural resources management system while assisting in the rehabilitation of Uganda's tourism industry to increase foreign exchange earnings. Private and Voluntary Organizations will have a major role in conservation and protection activities while private investment will be promoted through privately owned and operated lodges and tourism facilities. Management training of both park and private hoteliers along with other staff training will be provided.
ASIA					
PVO Co-Financing 497-0336	Indonesia		82-90	29,750	This project co-financed an estimated 75 technical assistance, training, and development projects planned and implemented by U.S. and Indonesian PVO's in USAID priority sectors including 20 activities in biodiversity conservation.
Natural Resources Management 497-0362	Indonesia	US Forest Service	90-96	18,500	This project is designed to strengthen the capacity of the government of Indonesia to develop natural resource policies and to conserve globally significant biological reserves. The project will develop a policy analysis and formulation capability at the national level; identify resource depletion problems and strengthen natural resource management planning capabilities at the provincial level in one outer island; and support the conservation of several globally significant biological reserves in one region by strengthening reserve management and inventorying existing resources.
Forestry Development 367-0158	Nepal	Ministry of Forest and Soil Conservation	89-93	8,000	Project is part of a multi-donor effort to strengthen the institutional capacity of Nepal's Ministry of Forest and Soil Conservation (MFSC) to plan and implement a national community forestry program. The project has two components: (1) a forestry policy and planning component will reorganize and strengthen MFSC's Planning Division (PD) with respect to planning, budgeting, monitoring, evaluation, analysis, and the development of an information system; and (2) an improved stove program component.
Institute of Forestry Project 367-0154	Nepal	Yale School of Forestry and Environmental Studies & Tribhuvan University	87-95	8,700	This project strengthens the capacity of the Institute of Forestry (IOF) of Tribhuvan University in Nepal to train foresters and natural resource managers at the B.S. and certificate levels, with special attention to community forestry management. The project will build on progress made to date in the institutional development of IOF and further improve the Institute's training capabilities, physical facilities, curricula, policies and program content. Assistance will be directed towards development of B.S. and field extension agent training programs, particularly as related to community management.
Rainfed Resources Development 492-0360	Philippines	Dept. of Agriculture Dept. of Environment and Natural Resources	82-86	24,000	This project supported the decentralization of land and water resource management (RM) in rainfed agricultural areas and related agroforestry activities, including regeneration of tree growth in degraded areas.
Natural Resources Management 492-0444	Philippines	World Wildlife Fund	90-92	125,000	This project is to develop sustained management of the Philippines' forests and other natural resources. It will work with both the public and private sectors in improving policy formulation, strengthening professional skills and key institutions, and developing sustainable forest production and management systems.

Project Title Project Number	USAID Country or Bureau	Primary Implementing Organization	Funding Years	Total Authorized LOP (\$000's)	Predominant Conservation Activity
Profitable Environmental Protection S79-0023	South Pacific Regional	Cooperative Agreement with the Foundation for the Peoples of the South Pacific	81-94	672	The project seeks to conserve forest and marine habitats of biodiversity and systems of essential productivity and to develop profitable enterprises and conditions conducive to their growth that protect vital ecosystems. PEP will assist regional governments to develop regulatory and monitoring systems in consultation with the S. Pacific Regional Environment Programme.
Management of Natural Resources and Environment for Sustainable Development 493-0345	Thailand		88-94	44,000	Project was designed to develop the capacities of the Thai government and non-governmental institutions to define, analyze, and respond effectively to current and emerging natural resource and environmental management problems.

NEAR EAST

Forestry Planning and Development 391-0481	Pakistan	Pakistan Office of Inspector General of Forests	83-91	35,000	This project was designed to achieve energy self-sufficiency and reduce deforestation in Pakistan by increasing national abilities to design and implement forest and fuelwood development strategies and by demonstrating the feasibility of producing tree crops on private farm and range lands.
--	----------	---	-------	--------	---

LATIN AMERICA AND THE CARIBBEAN

Environment and Coastal Resource Management (ENCORE) 538-0171	Caribbean Regional	Organization of E. Caribbean States	91-96	1,875	This new project will support community based activities in environmental training, environmental monitoring, and an increase of environmental awareness among the peoples of the E. Caribbean islands. A U.S. NGO will participate in bolstering community skills in management.
Forest Conservation and Management of the OSA Peninsula (BOSCOSA) 515-0255	Costa Rica	Conservation Foundation World Wildlife Fund	1990	1,000	This project helped to establish improved land use of the buffer zone around the Corcovado National Park, including agricultural and agroforestry activities where appropriate and related commercial activities.
Forest Resources for a Sustainable Environ- ment (FORESTA) 515-0243	Costa Rica	Fundación Para Desarrollo de la Cordillera Volcánica Central	89-90	7,500	This project was designed to promote forestry and agroforestry in buffer zones around the Braulio Carrillo, Poas, and Irazú National Parks and supports the management of the parks themselves.
Sustainable Uses for Biological Resources (SUBIR) 518-0669	Ecuador	Development Alternatives Inc. (DAI)	91-97	9,000	This project supports field demonstrations of appropriate technologies will be designed and implemented in selected ecological zones and social settings for the sustained, economically productive use of natural resources. It also will undertake policy studies to more clearly define the relationships between the use of natural resources and overall government policies for agriculture, tourism, colonization, and other relevant topics. The results of the field demonstrations, policy, and research will provide material for an educational campaign.
Maya Biosphere Natural Resource Management 520-0395	Guatemala	National Environmental Commission	90-94	10,500	This project will address deforestation and loss of biological diversity in the 1.5 million hectare Maya Biosphere Reserve by improving the management of the Reserve's tropical forests and other ecosystems.

Project Title Project Number	USAID Country or Bureau	Primary Implementing Organization	Funding Years	Total Authorized LOP (\$000's)	Predominant Conservation Activity
Forestry Development Project 522-0246	Honduras	Ministry of Natural Resources, Energy and Mines	88-93	20,000	This project seeks to improve the management and productivity of commercial pine forests in Honduras. The project will assist privatization and forest management, promote conservation and increase exports of foreign products through private sector involvement in production and marketing. It will help the Honduran Forestry Development Corporation to shift from direct production and marketing toward industry regulation and natural resource protection.
Natural Resources Management 524-0314	Nicaragua	IRENA	91-96	9,000	This project will help improve the management of renewable natural resources and protect biological diversity in selected sites in Nicaragua. Major activities will be the conduct of natural resource policy dialogue and institutional strengthening of IRENA; design of watershed management projects; plant protection and integrated pest management; sustainable natural resource use in forests, wildlands, and reserves; establishment of reserves with natural resource use management plans; and environmental education.
Natural Resources Management 525-0308	Panama	Ministry of Agriculture and Cooperatives	91-94	18,000	The project will seek to protect and manage Panama's renewable natural resources, with particular emphasis on the canal watershed. It will strengthen INRENARE's management capabilities and develop a land use capability classification system and will assist INRENARE in establishing national parks and reserves and improving management and protection of these areas to conserve threatened biological resources and ecosystems. It will establish a natural resource conservation foundation with a trust fund capitalized by a debt-for-nature swap. The fund will finance environmental activities and strengthen environmental NGOs and rural community groups.
Environmental Support Project 598-0780	LAC Regional	USDA, Chemonics	90-95	12,300	This project supports the provision of long-term technical advisers to assist USAID missions and the LAC/DR/E office. It will assist host countries in the design, implementation, and evaluation of AID-supported projects and other natural resource management activities. This will include pilot projects and studies directly related to biodiversity issues in the LAC region, and projects focusing on regional environmental issues and training activities.
Neotropical Migratory Bird Conservation 598-0795	LAC Regional	National Fish and Wildlife Foundation	91	500	The project supports actions to arrest the decline of neotropical migratory bird populations. It will provide grants to NGOs, government agencies and independent researchers.
Parks in Peril 598-0782	LAC Regional	The Nature Conservancy	90-92	5,000	The project seeks to ensure protection for 20 critically threatened national parks and reserves in Latin America and the Caribbean which have global significance.
Regional Environmental and Natural Resources Management 596-0150	LAC ROCAP	CATIE, The Nature Conservancy, CARE, Wildlife Conservation International, Cultural Survival	89-94	59,422	The project addresses the issues identified in the USAID strategy for environmental and natural resource management in Central America, including sustainable agriculture, production from natural forests, biological diversity, management of critical watersheds, policy formulation, institutional strengthening and environmental education. Research, extension and local actions throughout the region are supported through a diversity of grants and cooperative agreements, managed by ROCAP's Regional Agricultural Development Office.

Index by Country or Region

A

Africa (See also, Sub-Saharan Africa) 29
Angola 30
Asia 35

B

Bangladesh 24
Belize 16
Bolivia 17, 22, 23, 42, 43
Botswana 22, 30
Brazil 13-16
Burkina Faso 18
Burundi 17

C

Cameroon 15, 22, 30
Central African Republic 15, 30
Central America 13, 17, 27, 43, 45, 46
Chad 17
Chile 22
Colombia 14, 42
Comoros 17
Congo 15
Congo Basin 15
Costa Rica 14, 17, 18, 21, 23, 24, 42, 46, 47
Côte d'Ivoire 14, 22, 30

D/E/F

Dominican Republic 12
Eastern Europe 25
Ecuador 17, 23, 26, 27, 43, 45
Equatorial Guinea 14, 15, 30
Fiji 22

G

Gabon 15, 22
Galapagos Islands 23
The Gambia 17, 22, 26
Ghana 30
Guatemala 8, 17, 23, 26, 42, 44-46
Guinea 17, 30
Guinea Bissau 30

H/I/J

Haiti 17
Honduras 17, 23, 47
India 13, 21
Indonesia 13, 21, 26, 35, 38

K/L/M

Kenya 17, 32
Latin America 41
Lesotho 17
Madagascar 9, 31, 32
Malawi 22, 30
Mali 21
Mexico 12, 42

N

Namibia 30
Nepal 17, 25, 37, 39
Nicaragua 14, 23, 43, 44
Niger 17, 22, 30
Nigeria 30

O/P/Q/R

Pakistan 39
Panama 22, 42, 44
Papua New Guinea 37
Paraguay 16
Peru 42
The Philippines 17, 36
Rwanda 17, 30

S

Senegal 30, 31
The Seychelles 22
Sierra Leone 30
Solomon Islands 37
South Pacific 22, 26, 37
Sri Lanka 17, 22, 27
Sudan 30

T

Tanzania 24, 30
Thailand 25, 27, 38
Tonga 22
Tunisia 22

U-Z

Uganda 22, 30
Uruguay 22
Vanuatu 31
Western Samoa 22, 26
Zanzibar 24
Zaire 15, 30
Zambia 30
Zimbabwe 30

Index by Organization

A/B

African Wildlife Foundation 30, 32
AFRICARE 17
Applied Energy Systems 16
Associates in Rural Development 30
Bureau of Land Management (U.S.) 45

C

CARE 17, 30, 44
Caribbean Conservation Foundation 43
Catholic Relief Services 17, 32
Chicago Rainforest Action Group 42
Coastal Resources Institute 27
Colorado State University 42
Conservation Foundation 47
Consejo Nacional Para Areas Protegidas 42
Conservation International 26, 43, 44
Consultative Group for International Agricultural Research 9, 17
Cultural Survival 17

D

Defensores de la Naturaleza (Guatemala) 42
Department of Agriculture (U.S.) 21, 47
Department of State (U.S.) 18
Department of the Interior (U.S.) 45
Department of the Navy (U.S.) 45
Duke University 32

E

Energy Efficiency Institute 16
Environmental Protection Agency (U.S.) 45
European Community 15
Experiment in International Living 8, 15, 30

F

FAO (See United Nations, below)
Filipino Conservation Foundation 36
Fish and Wildlife Service (U.S.) 45
Forest Service (U.S.) 26, 45, 47
Foundation for the Peoples of the South Pacific 37
Fundación Amigos de la Naturaleza (Bolivia) 42
Fundación para el Desarrollo de la Cordillera Central Volcánica (Costa Rica) 46
Fundación Neotrópica (Costa Rica) 47
Fundación Pedro Vicente Maldonado (Ecuador) 27

G/H

Honduras Lumbermen's Association 47
Honduras National Forestry School 47
Honduran Forest Development Corporation 47

I

Indonesia Environment Forum 38
Intergovernmental Panel on Climate Change 9
International Board for Plant Genetic Resources 9
International Center for Forestry Research 9
International Council for Research in Agroforestry 9, 17
International Council for Bird Preservation 26
International Finance Corporation 16
International Maize and Wheat Improvement Center 9, 12
International Resources Group 37
International Tropical Timber Organization 9

J/K/L/M

Kenya Wildlife Service 33
Louis Berger International, Inc. 31
Missouri Botanical Gardens 32

N

National Association for the Management of Protected Areas (Madagascar) 32
National Council of Protected Areas (Guatemala) 45
National Fish and Wildlife Foundation (U.S.) 45
National Information Center for the Environment (Uganda) 31
National Institute for Renewable Natural Resources (Panama) 44
National Oceanic and Atmospheric Administration (U.S.) 27
National Park Service (U.S.) 25
National Science Foundation (U.S.) 14
National Seed Storage Laboratory 14
Nature Conservancy 16, 23, 12, 44
Nepal Conservation Training and Research Institute 39
New York Botanical Garden 43
New York Zoological Society 30
Nicaragua Institute for Natural Resources and Environment 43, 44

O/P/Q/R

Organization of Eastern Caribbean States 43
Osa Rainforest Fund 42
Pan American Development Foundation 8
Park Service (U.S.) 45
Peace Corps 21-23
Prince of Songkla University (Thailand) 27
Princeton University 25
Rodale Institute 44

S/T

San Diego Zoo 44
Save the Children 47
Smithsonian Institution 43
South Pacific Regional Environmental Program 23
Southeast Consortium of International Development 31
Tanzania Wildlife Conservation Society 24

U/V

United Nations 8
U.N. Conference on Environment and Development 9
UNDP 16
UNEP 9, 16
U.N. FAO 7, 3
University of California 44
University of Dar es Salaam 24
University of Florida-Gainesville 16
University of the Peace (Costa Rica) 23
University of Rhode Island 26, 27

W/X/Y/Z

Wilderness Society, The 43
Wildlife Conservation International 15
Wildlife Fund of Thailand 25
Wildlife Preservation Trust 43, 46
Woods Hole Research Center 17
World Bank 16, 32
World Conservation Union 9
World Resources Institute 9, 23, 30
World Wildlife Fund 15, 16, 17, 23, 25, 30, 32, 36, 47
Yale University School of Forestry and Environmental Studies 21, 37
Youth Conservation Corps (Belize) 23