

USAID highlights

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Tropical Forests: Saving a Vital Resource

Existing relatively undisturbed for millennia, tropical forests once covered more than 4 billion acres. Forests in some areas survived even the ice ages and are among the most ancient ecological systems on Earth.

Although they now cover only 2.5 billion acres, 7% of the Earth's surface, tropical forests are home to more than half the world's plants and animals—between 2.5 million and 20 million species. This biological diversity is unmatched anywhere else on the globe. But conservationists say that each day as many as 140 species of plants and animals may be disappearing as tropical forests are destroyed.

"Tropical forests are being cleared at the rate of between 50 and 100 acres per minute," says Judith Gradwohl, coauthor of *Saving the Tropical Forests* and curator of "Tropical Rainforests: A Disappearing Treasure," a Smithsonian Institution travelling exhibition. "Today's forests could be cut in half by 2035 and gone entirely by the end of the next century," she emphasizes.

The loss of tropical forests and their products will affect developed as well as developing countries. The teak in bookcases, the mahogany in dining room tables, the *Dieffenbachia* in planters, the cayenne in spicerracks, the cashews in cookies and the papaya in punch are all tropical forest products.

More important are the potential medical and industrial uses of forest products. A plant like the rosy periwinkle of Madagascar, which is used in treatments for childhood leukemia, may lie yet undiscovered, waiting to provide a cure for cancer or some other scourge. Curare, used as a muscle relaxant during surgery, and quinine, which has saved millions



Working with public and private organizations, USAID is helping conserve tropical forests.

from death from malaria, come from tropical plants.

As forests are destroyed, the indigenous peoples who dwell in them are displaced, and their centuries-old knowledge of the forest and its uses may be lost. For example, more than 130 species of medicinal plants used by the Quichua and Shuar Indians of Ecuador have been collected, including treatments for diarrhea, fever, intestinal parasites and snakebite. The scientific community needs these resources and time to study them.

Recognizing the crucial importance of tropical forests and the plants and animals within them, the U.S. Agency for International Development (USAID) is working to curtail destruction of forests and protect them by encouraging their use in a sustainable way.

"The Agency's central objectives of promoting economic expansion and improving human welfare in developing countries are critically dependent on the sustainable use of natural resources," USAID Administrator Alan Woods says. "USAID recognizes that the quality of life depends not only on economic and social development, but on environmental factors."

Protecting the Environment

A decline in forests means less fuelwood, fodder and timber. It means the loss of soil fertility, increasing soil erosion and degradation of fragile lands. It means changes in water supply for agriculture and energy, as well as increased flooding caused by rapid runoff, reduced navigability of rivers and pressures on fisheries.



Planting trees for sustainable use helps protect fragile soil from erosion and can provide local people with a source of income.

The primary factor in the clearing of tropical forests in all regions is the expansion of farming and livestock grazing onto forest lands. Agricultural expansion, in all its forms, is responsible for approximately 80% of all tropical deforestation. But the limited nutrients in forest soils are exhausted quickly. After a year or two, plots can no longer support crops or grazing, new areas are cleared, and the cycle of destruction is repeated.

Most of the forest converted for farming and grazing is cleared by burning, which itself has far-reaching consequences. The burning of tropical forests pumps nearly 1 billion tons of carbon dioxide into the air each year, significantly contributing to atmospheric gases thought to be causing a global warming trend (the greenhouse effect) by trapping the sun's heat in the atmosphere.

Among the projected results of global warming are a rise in sea level of two to six feet because of the melting of glaciers and polar ice caps and water's tendency to expand when heated. Most U.S. coastal lowlands, marshes and swamps would be flooded with seawater. The Indian Ocean island nation of the Maldives would be entirely submerged.

To many developing countries, however, cutting and clearing the forests may seem a necessity. Most are faced with the problems of feeding ever-growing populations, supplying lumber and fuelwood, and generating income to fund development and service massive foreign debts.

Natural forests are razed for crop production, livestock operations and homesteads with little regard to managing them for a long-term flow of goods and services. Between 1955 and 1980 alone, the extent of tropical deforestation matched the loss of tropical forests over the preceding two centuries. A vast frontier is rapidly being destroyed.

Unless this rate of devastation is slowed and reversed, re-

maining natural areas will continue to be converted to crop and livestock use, with land eventually becoming so depleted that it will not support even a low standard of living. Further erosion of rural livelihood and increasing migration of the poor to already overburdened urban areas will be an unavoidable outcome, causing even greater economic and social problems in developing countries.

USAID's tropical forestry program has become an important and integral part of the Agency's overall development effort. USAID currently has \$586 million (life of project) committed to approximately 150 forestry activities worldwide. The Agency also is exploring the possibility of debt-for-nature swaps (buying a portion of a developing country's foreign debt in exchange for its investment in forestry or other environmental projects).

To address the challenge of stopping deforestation, USAID has undertaken four interrelated approaches to conservation and management of tropical forests and their plant and animal life, including:

- protection of tropical forests and other natural habitats;
 - sustained production of plant and animal products and services from natural areas;
 - rehabilitation and reforestation of cut-over and eroded areas; and,
 - intensive management for improved plant and animal yields through agroforestry.
- "Used in concert, these approaches can help developing countries improve rural income and wealth, conserve forest resources, maintain watershed and environmental services and protect biological diversity," says Jack Vanderryn, USAID director for energy and natural resources.

Setting Regional Priorities

Most Agency-assisted countries in Africa have at least one forestry project or a forestry component of a larger project. In 1987, USAID launched a long-range natural resources management plan for sub-Saharan Africa. The plan makes natural resources management an important and integral part of all the Agency's African programs, including agriculture and rural development, women in development, policy dialogue, human resources and training, and data collection.

Of forestry projects in Asia and the Near East, three-fourths are aimed primarily at economically self-sustaining activities focusing on forest rehabilitation and intensive on-farm tree crop management through agroforestry.

In Latin America and the Caribbean, rapid deforestation and inappropriate land use have left hillsides eroded, making it difficult for poor farmers to produce sufficient crops for food or market. USAID's strategy in Latin America integrates protection and management of fragile lands primarily in tropical forest areas with sustained use for timber and other forest products as well as rehabilitation of eroded hillsides.

Vital forestry initiatives include:

- supporting preparation of country environmental profiles, resource assessments and conservation strategies to help coun-

tries examine their environmental problems more carefully and to plan effective solutions;

- funding an International Board for Plant Genetic Resources study of wild relatives of domesticated crops;
- encouraging the Honduran Forestry Development Corporation, the Honduran government agency responsible for forest management, to protect forests and use them as a renewable resource;
- employing refugees to establish nurseries and reforest 12,000 acres in Somalia and eastern Sudan;
- contributing to establishing a gene bank in India that will preserve germplasm for use by scientists, as well as working with the World Bank and the government of India to generate sustainable forest production and increase rural incomes in four Indian states; and,
- supporting Ecuador's *Fundacion Natura* in its campaign to gain support for conservation and sustainable development.

Conserving Diversity

An incredible array of plant and animal species lives in the world's forests, and USAID is helping to preserve this variety of life—this biological diversity.

Loss of a species means the loss of genetic material that may have had great value to humanity in improving crops, providing resistance to disease or offering a source of pharmaceuticals or industrial products and processes. In addition, a lost species may have had a great cultural significance for local peoples or played an important role in an ecological system.

Agency biological diversity conservation projects focus on wise use of biological resources.

Projects help countries protect and maintain wildlife habitats and develop sound wildlife management and plant conservation programs; establish and maintain wildlife sanctuaries, reserves and parks; identify, study and catalog animal and plant species; and enact and enforce anti-poaching measures.

In addition, USAID has signed a 10-year cooperative agreement with the World Wildlife Fund, the Nature Conservancy and the World Resources Institute for a biological conservation project.

One of the most

biologically diverse countries in the world, Madagascar may have more unique and endangered animal species than any other nation. The island's forest cover now has been reduced to 20-30% of its original extent. With the population multiplying rapidly, pressures on remaining forests are growing, and the integrity of protected areas is increasingly difficult to maintain.

Working with the World Wildlife Fund-U.S., the Agency has initiated an effort to integrate conservation with the needs of local people. The Madagascar Wildlands and Human Needs Project is aimed at stopping agricultural encroachment in the Beza Mahafaly and Andohacla national reserves. The goal is to generate support from the Malagasy people for the protection of reserves by improving their farming techniques and by linking their well-being to the success of the protected areas.

Promoting Forest Management

Deforestation on slopes and watersheds causes soil erosion, which leads to clogged waterways, reservoirs and irrigation canals; flooding; and disrupted hydroelectric projects. Half of the world's population lives in mountains or adjacent lowlands that are affected by tree cover on mountain watersheds. In 1988, deforestation of watersheds contributed to catastrophic floods in Bangladesh and Thailand.

Forests are important not only for the products they supply, but also for the valuable cover they provide for the soil. Tree roots give access to nutrients and water from deep within the ground, as well as structural support, thus stabilizing often fragile soils. Their leaves act as buffers against rain and provide vital organic matter and nutrients to the soil.

Without vegetative cover, many tropical soils rapidly lose their productivity. Denuded lands quickly become deficient in nutrients and organic matter and are easily eroded. Becoming hard and compacted, soils lose their ability to hold water. The initial result is declining crop yields. The ultimate result is often desertification and spreading wastelands.

About one-fourth of USAID's current portfolio of forestry projects focus primarily on land rehabilitation, reforestation, and natural forest and watershed management, exemplified by USAID's seven-year Forestry Land Use Planning Project in Niger begun in 1980. At the national level, the project has helped initiate development of a functional planning unit within Niger's Forestry Service that integrates land use planning and natural resource management with the country's other development activities.

On the local level, test sites were chosen in the Guesselbodi National Forest to demonstrate sound rehabilitation and resource management practices. Located on land long abused from overgrazing, overcutting and drought, the sites had lost most of their topsoil.

The main goal at the test sites was to use trees to rehabilitate deforested land and help prevent exhaustion of the soil through improper use. Working with the farmers cooperative, the project developed small-scale, low-cost rehabilitation techniques that provided immediate and long-term results.

Twigs and branches, previously considered waste, were used as mulch to protect and improve the soil. Grazing was restricted. Small, valuable crops and pasture plants were grown on the newly improved land. Part of the revenue from the forest's products was



Finding alternatives to fuelwood and devising more efficient stoves will help decrease pressures on forests.

used to protect it. The model sites demonstrated that natural forest management is both economically and ecologically viable. Local users were provided with forest products, the land was restored and wildlife was returning to the protected areas. For the first time in the Sahel, management of a natural forest is paying for itself.

Planting Trees for Profit

Growing trees helps to reduce pressure on tropical forests, maintain watersheds and provide opportunities for employment and income for farmers, particularly those living on marginally productive or exhausted land. Agroforestry involves growing agricultural and tree crops on the same land simultaneously or sequentially. It draws on traditional sustainable agriculture, forestry and livestock systems combined with modern technology.

USAID's agroforestry program supports rural development by targeting assistance to farmers who have very few resources to invest in their land, by sustaining agricultural production through rehabilitating cultivated areas and newly cleared tropical forest plots, and by contributing directly to the rural economy through increased production of fuelwood, animal fodder, timber, poles and raw materials for industry.

Although Haiti was once almost completely wooded, only 7% of its forests remain. Trees have been cut for the fuelwood and building materials on which Haitians depend, and, as a result, soil erosion is widespread.

USAID's Agroforestry Outreach Project, begun in 1981, encourages Haitian farmers to plant and maintain trees on their farms, reducing pressure on remaining Haitian forests and increasing the long-term productivity of the land.

With a USAID grant, the Pan American Development Foundation helps Haitian farmers create tree nurseries for growing and distributing seedlings and trains extension agents to motivate and guide the farmers in planting and

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caring for the trees.

USAID also contracted with CARE to work in the arid northwest, the country's charcoal producing region. CARE has trained local project staff and village extension workers, who, in turn, train participating farmers. To date, they have helped more than 17,000 farm families plant 5.2 million seedlings and have supported development of

10 central nurseries.

Encouraging Cooperation

Many public and private organizations are partners with USAID in efforts to preserve tropical forests and biological diversity.

The Agency is involved in the Tropical Forestry Action Plan, a major international effort to increase the relevance and effectiveness of forestry and related development programs in resolving the social, economic and environmental problems resulting from tropical deforestation. Agency support established the Consultative Group on Biological Diversity to help private foundations coordinate and expand their efforts to fund biological diversity conservation activities in developing countries.

"USAID has been a leader in the development community in many forestry initiatives," Vanderryn says. "The Agency has been a major player in guiding others in the right direction in managing the environment and natural resources."

USAID fights to conserve the world's tropical forests not only for their usefulness, but for their beauty and unmatched diversity. By helping countries devise development strategies with sustainable uses for their precious natural resources, the Agency is working to benefit all people—and generations to come.

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