

# USAID

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## Agency Puts Accent on Sustainable Agriculture

Many Americans are familiar with agricultural techniques such as contour farming, controlled irrigation, minimum tillage and other soil-conservation methods. Careful management of forests and reforestation are common practices. These and other measures help ensure that land continues to be productive over time.

That is not the case in many developing countries, where short-term benefits usually take precedence over considerations for the future. "Policies and practices are often based on meeting immediate needs, with little thought given to long-term planning," says Vince Cusumano, chief economist for USAID's Office of Agriculture.

Growing populations have led to demands for increased food production. That pressure, coupled with other factors such as increased urbanization, lack of appropriate technology and political instability, has resulted in deforestation, conversion of marginal land for agricultural purposes and poor use of land once it is converted.

The result? A deteriorating natural resource base and, ironically, the inability of many developing countries to produce enough food.

The degradation of the resource base has been a major factor in declining rates of economic growth, says Cusumano. "If policies are made with no regard for their effects on the future, the natural resource base begins to erode," he notes. "As that happens, the ability of a country to achieve economic growth suffers."



To reverse severe deforestation in the Third World, USAID programs, such as this one in Burkina Faso, are aimed at regenerating forests.

Several countries serve as illustrations of the problems occurring:

- In Haiti, a small island country once almost covered by trees, forests have been reduced to less than 10% of the land area, causing severe erosion and shortages of tree fodder and fuelwood;
- In Mali, where grasslands once covered an area the size of Texas, some nomadic tribes are near starvation because much of the land on which they once lived is turning to desert; and,

- In Nepal, intensive livestock grazing and the search for fuelwood have caused severe deforestation. As a result, much of the country's public lands have been damaged.

These individual cases are only examples of worldwide problems. Viewed overall, the broader statistics give more reason for concern:

- About 60% of the world's rangelands are moderately to severely desertified. More than 80% of the rangeland in Africa, South Asia and the Near East is affected;

- Eleven million hectares of tropical forests are being converted to other uses annually. In just 25 years, between 1955 and 1980, the extent of tropical deforestation worldwide matched the loss of tropical forests in the last two centuries; and,
- Unless checked, soil erosion could reduce by 20% the world's potential agricultural production by the year 2000.

## PRESSURE MOUNTS

Until the late 1970s, says Molly Kux, environmental coordinator in USAID's Bureau for Science and Technology, maintaining the natural resource base in developing countries was not a major concern. Agriculture was viewed as a source of revenue to be transferred to areas such as manufacturing and infrastructure. "Renewable resources were being mined to support development in other sectors," she says.

That trend coincided with tremendous population growth in the 1960s and 1970s, with the combination creating pressure on the agricultural sector to produce more food. As the pressure mounted, the search for arable land intensified.

Much of the best agricultural land in developing countries is already in use or is in the hands of only a few owners. "With increasing populations and the resulting pressure to produce more food, people look at marginal areas to farm," says Kux. "The need for land, coupled with a demand for fuelwood and overgrazing, has resulted in deforestation."

The tendency has been to use the traditional "slash-and-burn" method of preparing the land for planting, in which trees and vegetative cover are cut away and burned, using few or no conservation techniques.

After several years of planting, the land can recover naturally, she notes, but that process requires that the land go unused for 10 to 20 years. With all the pressure to produce food, the rest period is shortened to three or four years,

which does not allow the soil to regenerate fully. Over time, the process of soil depletion leads to severe land degradation.

The problem, Kux says, is basically the same everywhere: people expanding onto and using marginal land. But the kinds of land can be radically different, she points out, ranging from arid to semiarid to rain forest. Because cultural patterns vary, as do physical and biological systems, the solutions must be adapted to local conditions.

## A LONG-TERM APPROACH

To counteract the vicious cycle of soil erosion, loss of fertility and deforestation, USAID promotes agriculture techniques that support the conservation of the natural resource base, says Duane Acker, assistant to the administrator for food and agriculture. "Our programs encourage the prudent use of inputs such as seeds, fertilizer, machinery and labor to permit the optimum use of land, without degrading the natural resource base and actually improving it."

The keys to success are the words maintain and enhance, says Cusumano. "It's a dynamic concept and is based on the need to consider future requirements in the decisions we make today. By doing so, the Agency can help developing countries meet the needs of future generations as well as those of people today."

Sustainable agriculture can be intense, high-density agriculture, says Acker. "It involves proper techniques that will make the most effective use of good farmland so that there is less population pressure in the fragile or marginal areas."

## USAID's RESPONSE

USAID is supporting sustainable agriculture in a number of countries, using the varied techniques that Kux says are essential because of the different problems that countries face.

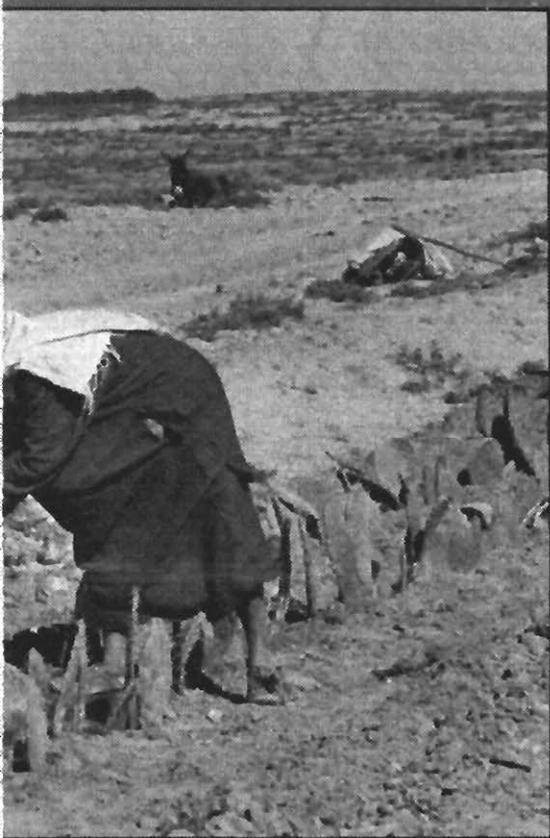


With increasing populations and the rest people turn to marginal areas to farm.

The Agency is working to promote agricultural systems that can replenish chemical nutrients in the soil that are removed by crop production, maintain the physical conditions of the soil and avoid increases in soil acidity or toxic elements, Cusumano says. In addition, the Agency promotes systems that control weeds, pests and diseases with minimal use of chemicals as well as systems that control soil erosion.

To achieve these goals, USAID activities are designed to:

- Introduce farming systems that include soil conservation;
- Promote crop production that reduces the need for toxic chemicals;
- Incorporate tree species into farming systems (i.e., agroforestry) where feasible;
- Promote efficient on-farm water use;
- Introduce self-sustaining energy resource techniques such as tree planting and use of solar energy;
- Strengthen the institutional capacity of the country's research, education and extension systems;



...ing pressure to produce more food,

significant benefits. Seed spacing, for example, is a technique that has brought dramatic results. In some areas of Honduras, farmers have added terraces and increased or decreased the spacing pattern between seeds, and the yields of many grains have doubled.

That kind of success has a ripple effect, says Cusumano. "When other farmers see tangible improvements such as higher yields, they are more eager to adopt those practices that produce higher yields."

Considerable resources also are devoted to enhance biological diversity, says Cusumano. In fiscal 1987, USAID obligated \$2.54 million for 21 new activities in 19 countries to directly protect and conserve plants and animals in developing countries. A total of \$2.2 million was allocated for biological diversity that was part of other projects.

The Agency has established an internal Biological Diversity Working Group, which sets priorities and reviews projects. USAID also helped to establish a Consultative Group on Biological Diversity, whose goal is to coordinate private funding of biodiversity conservation projects in developing countries.

## FOREST REGENERATION

The Agency's forestry programs are aimed at supporting rural development by targeting assistance to farmers who have few resources to invest in their land; protecting or rehabilitating cultivated lands and already cleared tropical forest lands; and contributing to the rural economy through increased production of fuelwood, timber, poles and raw materials for industry.

In 1987, USAID supported 134 forestry projects in 43 developing countries with total funding of \$541.3 million.

The Agency also has taken a key role in developing agroforestry, which makes use of multipurpose trees and is usually carried out on a small scale with individual farmers. Projects are managed for short-term as well as long-term benefit.

A number of such systems are in use, but all have two common features: They improve the productivity of the soil while contributing to agricultural production and yielding other fodder, fuelwood, timber and multipurpose benefits. Agroforestry techniques that the Agency is supporting include:

- Intercropping, in which food crops such as millet, sorghum, corn and groundnuts are grown under naturally occurring open stands of trees. Projects and experiments are being carried out in Mali, Burkina Faso, Chad, Senegal, Niger and northern parts of Nigeria;
- Alley cropping, in which a crop such as maize is grown between hedgerows of trees. USAID-supported experiments are being conducted at the International Livestock Center for Africa and the International Institute for Tropical Agriculture;
- Contour hedge-row farming, in which alley cropping is adapted to hillside farming. *Leucaena*, *gliricidia* and other tree species are used to grow hedgerows that conserve topsoils. USAID supports projects using this technique in the Philippines and Indonesia; and,
- Windbreaks in arid and semiarid areas, in which trees are planted to protect millet and sorghum from the wind. An example is the USAID-supported Majjia Valley Windbreak Project in Niger.

Forest regeneration boosts agriculture and energy supplies. Trees can reduce wind erosion and rainfall runoff on farmland and can increase soil porosity, which increases infiltration of rain. Trees, particularly of the leguminous variety, also fix atmospheric nitrogen and recycle other soil nutrients. All of this can stabilize, and possibly in-

- Promote efficiency in the marketing of agricultural commodities;
- Incorporate sustainability in policy discussions with developing countries; and,
- Promote programs that provide incentives for long-term agricultural development.

USAID is translating these approaches into programs that include a variety of activities in land use planning, soil conservation efforts and reforestation. USAID's missions in Asia and the Near East have allocated more than \$248 million to enhance the natural resource base. Missions in Africa are spending an estimated \$430 million and those in Latin America and the Caribbean an estimated \$220 million.

The figures represent life-of-project funding, and some of the projects are not devoted specifically to sustainable agriculture, Cusumano notes. Nonetheless, the numbers are substantial.

The Agency also supports research in agricultural techniques that may produce

In the Winter 1988 *Highlights*, a map incorrectly identified Nepal and Morocco as heroin-producing countries. They are heroin-trafficking and marijuana-producing countries. *Highlights* regrets the error.

crease, crop yields.

Farm trees also can be a significant source of fuelwood. As few as 50 trees on a two-hectare farm, occupying less than 5% of the arable land, can supply half or more of a family's fuelwood needs by regular pruning and selective cutting.

Judicious use of trees for fuelwood can help prevent the indiscriminate overcutting of trees that not only depletes a source of fuelwood but damages the land.

### A MATTER OF POLICY

The Agency is supporting more research to evaluate the policy decisions made by developing countries with an eye toward seeking change in policies that provide incentives to farmers and others to employ sound agricultural, land development and conservation techniques.

For example, the government of Indonesia decided to ban the use of certain pesticides, says Kux. At the same time, however, the government was providing subsidies to farmers for pesticides, thus encouraging their overuse. "The two programs worked against each other," she notes. "Policies must be changed to solve such problems."

In implementing its projects, the Agency works closely with private voluntary organizations (PVOs) in

developing countries. "PVOs work at the grassroots level and are particularly effective in local communities," says Cusumano. "They have people in the field who can work closely with farmers to make programs successful."

USAID also supports programs that improve natural resource management in developing countries.

A project in Honduras is typical of that effort. The seven-year, \$20 million program will improve the management and sustainable productivity of commercial pine forests as well as provide for greater efficiency in the marketing and processing of wood products from one area in the country. The project also will help the Honduran National Forestry Corporation to strengthen its ability to manage forests as renewable resources.

"Policy questions are extremely important," says Acker. "USAID is

working to elevate the sensitivity to and knowledge of resources in developing countries and to encourage these countries to employ methods that are economically and environmentally advantageous."

### NOT JUST A SLOGAN

USAID has sought advice from scientific experts in the United States on the technical aspects of sustainable agriculture. The Agency last year convened a panel of these experts, drawn from fields such as agronomy, chemistry and economics, to examine its programs in the area. "They were very complimentary of our efforts," says Cusumano. "At the same time, we know we don't have all the answers. There are still questions."

The panel stressed that sustainability features be included in every Agency program, a process that is under way, says Cusumano. "We don't want it to be just a slogan," he asserts. "It should be part of everything we do."

Sustainable agriculture is really a balancing act between current and future needs, says Cusumano, who adds, "The actions and policies that we and those in developing countries make today will have an impact on the ability of our children, and their children, to sustain their needs."

### USAID Tropical Forest Projects

Region	Number of Countries With Projects	Number of Projects Active in FY 1987	FY 1987 Forestry Obligations (in \$1000)
Africa	21	41	11,085
Asia/Near East	10	40	22,982
Latin America/Caribbean	12	44	16,498
Central Bureaus (S&T)	n/a	9	6,718
Total	43	134	57,283

Source: Forest Project Database, Forest Support Program, Idesi Inc.  
\*Some forestry projects are components of larger USAID projects

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