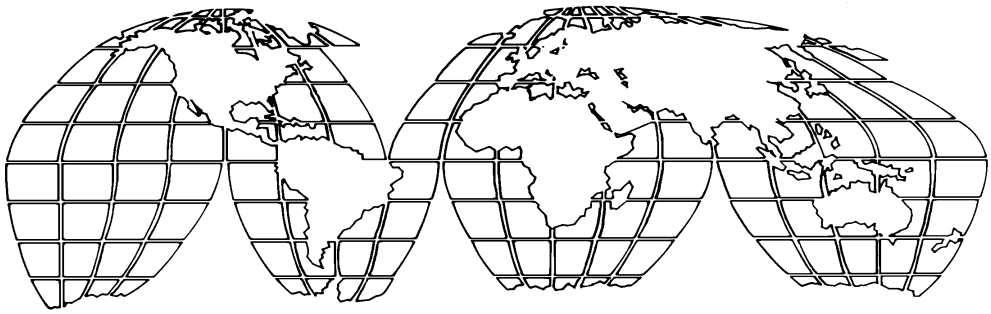
USAID EVALUATION HIGHLIGHTS NO. 53 **April 1996**

Forestry and the Environment: Costa Rica Case Study



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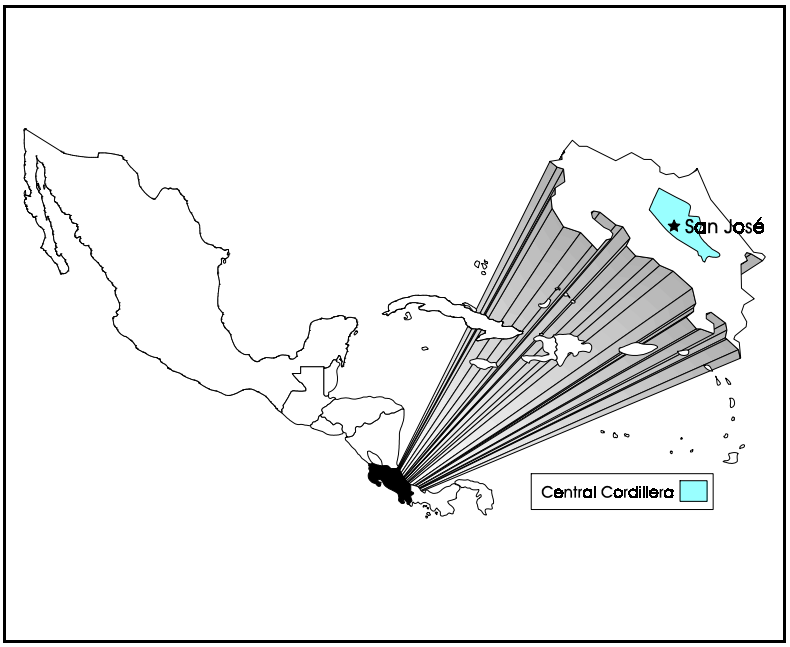
Summary

Rapid deforestation threatens Costa Rica's ecological balance and continued economic growth. Very little forest remains outside a few protected areas. What survives of these remaining forests will be depleted by the turn of the century if current trends continue.

But Costa Rica is making a determined effort to change the course of events. USAID has supported this commitment through several project loans and grants since the late 1970s. The most recent USAID effort—and the subject of this evaluation—is an ongoing $7.5 million project, Forest Resources for a Stable Environment (FORESTA, 1989–96). It supports ecologically sound, long-term economic development of the protected and buffer zone areas in Costa Rica's central volcanic cordillera conservation area (ACCVC).

FORESTA finances activities of a regional environmental nongovernmental organization, the Foundation for the Development of the Central Volcanic Cordillera (FUNDECOR). This NGO works with the Costa Rican Forest Service and national and international research and educational institutions. Together they help landowners and residents in the central cordillera (1) manage the remaining natural forests for the sustainable production and use of timber and other products and (2) establish plantations of native tree species and (3) promote agroforestry to increase the productive capacity of degraded pastures and secondary forests.

In 1994 USAID's Center for Development Information and Evaluation (CDIE) examined the activities of FORESTA as part of a world-



wide assessment of Agency-assisted forest conservation programs. CDIE has also looked at forestry programs in the Gambia, Mali, Nepal, Pakistan, and the Philippines.

At the time of the evaluation, FORESTA was in its third year. In that brief time it had brought 11 percent of the ACCVC's 77,000 hectares of privately owned forest (33 square miles out of 300) under more sustainable management. It has promoted private sector reforestation with native species on about 1,000 hectares. FORESTA has also provided employment for a significant number of men and women involved in tree nursery and planting activities.

Progress can be attributed to (1) creative approaches to forest management, (2) a political and social framework conducive to cooperative problem-solving among participating public institutions and nongovernmental organizations, (3) availability of new–forest management and native-species plantation technologies, and (4) strong USAID project management support. Modest government subsidies for natural-forest management and reforestation have also contributed to early successes of these programs. However, FORESTA is also developing contractual arrangements with owners of natural forests that do not depend on public funding over the long run.

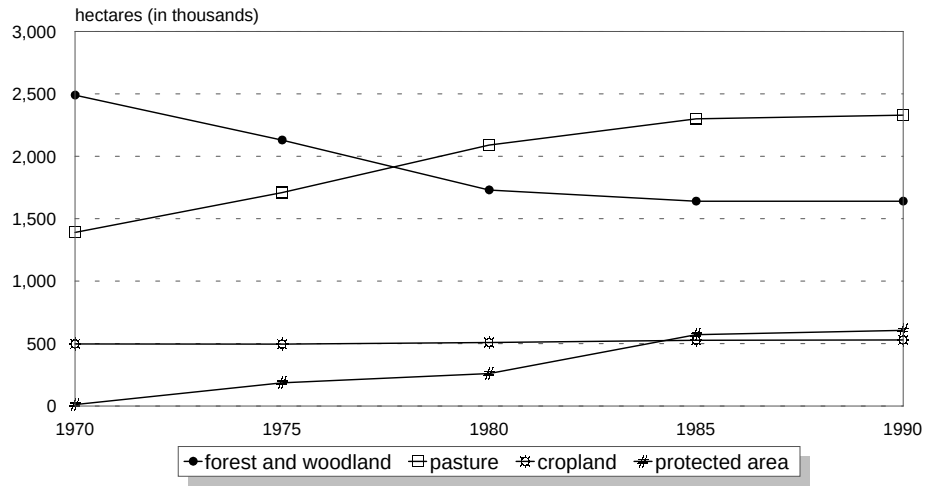
Background

From 1970 through 1989, deforestation at the rate of 50,000 to 60,000 hectares a year reduced Costa Rica's forest cover to approximately 10 percent of its national area, compared with 70 percent in 1940. As in many tropical countries, the major cause has been conversion of forest to crop production by small cultivators and to pasture for cattle raising among larger landowners.

Until very recently, government policies sped deforestation by granting land titles to settlers who agreed to make "improvements" to the land—that is, to clear the forest for farming or ranching. Trends in land use from 1970 through 1989 reveal the steady loss of more than 1.5 million hectares of forestland and an almost equal expansion of pasture area (see figure).

The government realizes it must do better to meet threats to its forest resources. It is now testing innovative approaches to halt the deterioration of its natural forests. The current approach, launched in 1989, is creation of a national system of conservation areas (see box 1). The legislature has not yet approved this measure, but the implementing agency, the Ministry of Natural Resources, Energy, and Mines, has begun to group the nation's 75 protected areas and the lands around them into 7 large conservation areas. They will be managed by independent administrative bodies, with scope for NGOs (including local community groups and entrepreneurs) to play important conservation and development roles.

Under the new system, the efforts of key players are concentrated within these high-priority conservation areas. The players are the government's principal conservation agencies (National



Source: FAO 1987, IUCN 1990b, WRI 1992b.
Notes: Forest, woodland, pasture, and cropland data are from 1971, 1976, 1981, 1986, and 1989. Protected-area data are from 1970, 1975, 1980, 1985, and 1990.

Park Service, Forest Service, and National Wildlife Service), national and international NGOs, the private sector, and the donor community. The system aims at maintaining natural ecosystems, preserving genetic diversity, and promoting sustainable natural resource use.

USAID's Assistance Approach

USAID's development strategy in Costa Rica through most of the 1970s and 1980s consisted mainly of support for export-led growth. In 1979 the Agency revised its strategy by adding the management of the nation's natural resource base (particularly of its national parks and contiguous commercial forests) to achieve sustainable economic development. The Agency recognized that runaway deforestation was moving Costa Rica toward becoming a net wood *importer*. More serious, logging was threatening the nation's water supply, hydroelectric power, productive capacity, and biological diversity.

The most ambitious of several recent initiatives is the $7.5 million FORESTA project. USAID and the Government of Costa Rica designed FORESTA to support ecologically sound long-term economic development of the protected and buffer zone areas in Costa Rica's central volcanic cordillera conservation area. Located within a few hours' drive of the country's major population centers, the ACCVC contains some of the largest blocks of primary forest remaining in Costa Rica. It also holds two of the nation's top tourist attractions (the Poás and the Irazú Volcanoes National Parks) and one of its richest biological reserves (Braulio Carillo National Park).

FORESTA supports conservation of Costa Rica's forests through actions of a newly created NGO, the Foundation for the Development of the Central Volcanic Cordillera. The foundation provides technical assistance and funding for managing the ACCVC's protected areas. It also promotes sustainable production and use of surrounding buffer zone forests. USAID and the Costa Rican Government have agreed to use local currency proceeds from a debt-forgiveness program to establish an endowment to fund FUNDECOR operations after FORESTA support ends.

Box 1. Conservation Areas: Each Is Unique

In 1989 the Government of Costa Rica devised a national conservation area system approach to forest and wildland management. The system consolidates protected-area conservation and contiguous forest management, endeavors to meet the socioeconomic needs of local communities, and serves other national and international interests. Broad objectives of the new system include preserving genetic diversity, maintaining processes of natural ecosystems, and permitting sustainable harvest of plant and animal species.

Specific objectives of the system include

- Establishing endowment funds for each conservation area to ensure long-term financing
- Decentralizing government agencies to give each conservation area more decision-making and management autonomy
- Establishing financial and administrative systems with the involvement of NGOs
- Involving community participation in different activities within the system to promote local stewardship of the natural resource base

The conservation areas are groups of contiguous or clustered lands placed in one of several management categories depending on their biophysical features, socioeconomic characteristics, and regional relationships. Each conservation area includes one or more core areas (such as national parks), managed for biodiversity conservation. Each includes as well surrounding buffer zones—governmental wildlands (forest reserves, wildlife refuges, and other protected areas) or private lands where sustainable uses of natural resources are promoted. Such uses include nature tourism, wildlife management, and controlled extraction of timber or fuelwood.

Each conservation area has its unique characteristics and needs, calling for independent administrative bodies. The government has legal authority for management and decision-making, whereas NGOs play an important role in actual development and implementation. Each conservation area has a regional advisory commission, made up of local community representatives and government agency staff.

FORESTA is also helping redefine the role of NGOs and government agencies in conserving forests and associated natural resources (soil, water, biological diversity). Major project interventions include introduction of

- Techniques for preparing natural-forest management plans that simplify the process, reduce the cost, and improve the quality of the plans.
- Logging contracts with performance clauses to promote the adoption of practices that minimize forest damage and promote rapid regeneration.
- Native-species tree plantations that ensure a supply of quality seed, promote associated small businesses, provide employment opportunities, and help landowners enhance the productivity of their land.
- Cooperative relationships between various institutions to develop and promote improved forestry practices. Groups include the U.S. Forest Service, the Organization for Tropical Studies (composed of various U.S. and Costa Rican academic and research institutions), and the Center for Tropical Agricultural Research and Education (an arm of the Organization of American States).
- An endowment fund to finance a share of FUNDECOR start-up and operating costs.
- Involvement of research and educational institutions to supplement FUNDECOR technical services
- Introduction of global information systems technology (satellite-generated mapping) to cut the costs of preparing forest management plans and monitoring program performance
- Cooperation between FUNDECOR and government agencies (especially the Forest Service and the land-titling agency) to introduce reforms more appropriate to natural forest management and reforestation using native tree species

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FORESTA has led to development of a strong (although not yet financially independent) institution, FUNDECOR, capable of applying appropriate technology to management of forest and land resources in the ACCVC. Technical assistance to the foundation appropriately emphasized developing administrative and financial systems and establishing contacts with Costa Rican research institutions.

FUNDECOR is staffed with professionals dedicated to the idea that conservation and development can complement each other. FORESTA provides office and field equipment necessary to support the foundation's operation during project implementation. The USAID-funded vehicles of U.S. origin, however, are not suitable for some remote working conditions. Maintenance is also a problem, since U.S. manufacturers do not provide adequate service and parts support in Costa Rica.

FUNDECOR uses a combination of training, supervision, and contractual agreements to ensure that loggers and landowners adopt sustainable forest management practices. The foundation provides funding, training, and technical assistance for nursery operators. It furnishes technical and administrative support to community and farmers' organizations engaged in replanting deforested areas. It has commissioned the preparation of forestry guidebooks

Evaluation Findings

Program Implementation

The early progress of the project can be attributed to the following institutional, technological, and policy factors:

- Recruitment of professional staff trained in promoting ecologically sound forest development in the buffer zone areas of the ACCVC and dedicated to developing FUNDECOR into a financially viable institution

and has provided support for a variety of publications on native tree species.

The foundation also assists landowners in the central cordillera in managing their forests or establishing native-species plantations on their degraded pastures. It uses its computers and global information system technology to establish priorities for its forestry work and, more important, to reduce the cost and simplify the task of preparing forest management plans.

FUNDECOR draws on technologies in natural-forest management and native-species tree plantations developed by the Organization for Tropical Studies, the Center for Tropical Agricultural Research and Education, and other research institutions. FORESTA does not support research. Rather, linkages with these institutions means FUNDECOR can channel its funds more effectively into applying new forest technologies and identifying knowledge gaps for these organizations to address.

Program Performance

Program Impact

In its first 3 years FUNDECOR has contracted with the owners of more than 8,000 hectares of forest in the ACCVC to help them manage, in a sustainable way, their land for timber production. The foundation's natural-forest management plans are well prepared and implemented, and carefully monitored. The plans are oriented toward sustainability and involve landowners in the management of their forests. FUNDECOR staff supervise logging operations to ensure that companies meet the standards of road construction, felling, and removal of logs required for minimum impact on the forest.

Where FUNDECOR-promoted practices have been followed, damage to forests, soil, and streams is low. More important, participants in the foundation's forest management activities have contracted to maintain forest cover. In most other logging operations the timber harvest is merely the first step in converting forest to agricultural use. The foundation also assists landowners in obtaining clear title to their forestland without the necessity of clearing the forest.

Box 2. How FUNDECOR Nurtures Native Species

Most tropical forest plantation research concentrates on popular species managed in block plantations on good soil types. Costa Rica takes aer harvest icluded nativs trer species(planged on)]TJ10 -1.08 i(tr-aer-har-)]TJ1TD10.014Tc0.173Tw1[oduted The following new tec(nologi

FUNDECOR and its co-operators have agreements with more than 80 landowners to establish more than 1,000 hectares of native-species tree plantations. This is noteworthy, especially given the effort that has gone into seed tree selection, contracting for a seed supply, establishing private sector nurseries, and identifying contractors for establishing and maintaining plantations (see box 2). Native-tree plantations established by FUNDECOR show initial positive signs of healthy tree growth. It is, however, too early to know exactly what that implies for the environment. The logic of using native-species plantations to enhance wildlife habitat and conserve biological diversity in buffer zones *appears* sound, but there is not yet sufficient evidence to support this hypothesis. Native tree plantations are still too young and do not cover a large enough area to have a significant effect on wildlife habitat.

FUNDECOR has helped landowners increase their incomes from timber harvesting and from establishing native-species tree plantations on portions of degraded pastures. The principal direct beneficiaries of the foundation's activities have been landowners participating in the natural-forest management and reforestation programs. A few of these individuals have sizable landholdings, and some are professionals who do not live in the area. The majority of participants in the reforestation program, however, are smaller landowners. They take part through membership in one of the two cooperating cantonal agricultural centers (Sarapiquí and Siquirres). Some larger landowners in the natural-forest management program live and work in the area. One works, for example, as a contractor for the project, providing day laborers to clean weeds from tree plantations.

*By acting as an intermediary buyer of seed and seedlings and as a contractor for tree-planting and forest-management services, FUNDECOR has generated new forestry investment and employment.*The current single seed-collection contract, four nursery contracts, and range of tree-planting contracts represent the start of an industry based on native tree species. The nursery operators—two of whom are small farmers—also represent a spectrum of social and economic backgrounds of potential investors and workers in the business. Tree nurseries are labor-intensive operations that, along with tree-planting contracts, provide employment and incomes for both men and women.

Effectiveness

FORESTA reforestation and natural-forest management activities are reaching a broad spectrum of socioeconomic groups, but larger landowners dominate. FUNDECOR has chosen to emphasize one-on-one activities with larger landowners in the central cordillera conservation area to put large areas of land under improved management quickly. The foundation has reached smaller landholders largely through its tree seedling nursery program and through employment opportunities under its reforestation contracts.

Efficiency

Increased efficiency in reforestation and natural forest management has resulted from initiatives to reduce planting costs and forest management plan costs and to raise timber prices for landowners. FUNDECOR reduces the costs of establishing plantations by combining the land of several landowners and letting large contracts for planting and cleaning. Similarly, the foundation recently began combining the timber holdings of several landowners and auctioning timber harvest rights on the combined holdings. Establishing larger harvesting contracts and sealed-bid auctions has resulted in higher stumpage prices to owners. The reduced cost of management plan preparation also makes forest management more profitable.

Sustainability

The economic viability of reforestation in the ACCVC depends on critical assumptions about the performance of native tree species and the continuation of public incentives. The performance of native tree species is yet to be determined. There is as yet little evidence of the biophysical sustainability of native tree species in plantations over the long run. Available data from research by the Organization for Tropical Studies on native tree species in plantations points to a promising but still inconclusive outcome for commercial native-species plantations in the central cordillera. The research was carried out under limited conditions that do not

reflect the site variability encountered in fields where tree plantations are being established. Thus FUNDECOR's promotion of native-species plantations must at this time be considered experimental.

Similarly, the earliest plantings by the Organization for Tropical Research are not yet old enough to determine rotation lengths or provide the information necessary to calculate rates of return on investments in forest plantations. The risk to the landowner is reduced, however, by modest government subsidies and earlier research on native tree species performance.

Another long-run uncertainty is how long the Costa Rican Government will be willing and financially able to subsidize reforestation costs. The subsidy now provided is important to helping many landowners finance investments in clearing, planting, and managing the land on which new trees are planted. Demand for reforestation subsidies on a nationwide basis already exceeds funds available.

Without outside financing the government probably cannot expand the subsidy program to support reforestation rates needed to have any real effect. Lowering per hectare subsidy rates might help adjust supply and demand and result in landowners' assuming a fairer share of the risk involved.

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Replicability

Reforestation with native tree species has begun to spread beyond FUNDECOR operations in the ACCVC. Availability of reforestation subsidies has increased interest in establishing plantations throughout the nation. Despite limited nursery capacity and the limited evidence, so far, of success, native-species plantations are appearing in other areas. Nurseries in the ACCVC are selling native and exotic species to landowners in the Río San Carlos area of northern Costa Rica and in the area around the Caribbean port of Limón. Organizations from conservation areas, including the northern, Caribbean, and southern areas, have formed an association of groups interested in native-species plantation technology.

The information base of 8 to 10 years on native tree species performance is unique to the central cordillera conservation area and not available for supporting replication of FUNDECOR reforestation in other areas. The Organization for Tropical Research and others have recently begun research on native species in the Caribbean and southern zones of Costa Rica. It will probably take at least another decade before enough data are available to support native-species programs in either of these zones. Despite the lack of research, some risk-takers are already involved in tree-planting programs that include native species in each of these zones. As discussed above, FUNDECOR's native-species tree plantation program is not risk-free, but attempting to implement a similar program without at least a similar research base will greatly increase the risk.

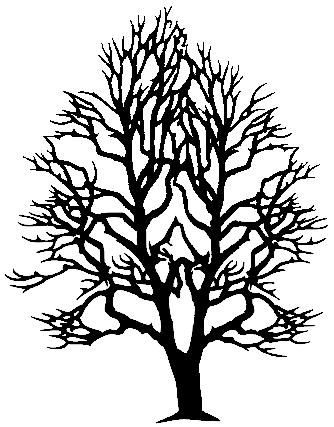
It will probably be much longer before a native-species program similar to FUNDECOR's can be replicated in many other Latin American countries. Few, if any, such countries have access to research institutions with the facilities, personnel, and financial support available to the Organization for Tropical Research and the Center for Tropical Agricultural Research and Education and their Costa Rican collaborators. A plantation program similar to FUNDECOR's could be carried out elsewhere only if research results were available and local institutions could provide research support. Absent information and research institutions, any attempt to replicate FUNDECOR's program would be very risky.

Lessons Learned

Given the long-term nature of forest conservation and the relative recentness of environmental interventions in Costa Rica, much about the FORESTA project remains speculative. Still, two early, concrete lessons do emerge:

Contracting for services can be an effective means of transferring knowledge, raising awareness, and changing behavior of natural resource users. FORESTA has contracted for natural resource management as a means of encouraging private tree planters and loggers to follow more responsible forest management practices. Contracts contain conditions and compliance requirements regarding tree extraction in a way that does the least damage to the forest. However, administering contracts and supervising their compliance is staff-intensive.

Long-term project assistance is required when attempting to establish new NGOs with broad responsibilities for cooperating with other NGOs, community groups, government agencies, and research and educational institutions to manage forest resources. USAID support to FUNDECOR through FORESTA will last less than 5 years. This is only enough time to set up and test a new system of NGO–government partnership in forest management. It is insufficient time for achieving self-reliance given that the NGO must first develop and carry out a program that addresses complex forest conservation needs. Organizations such as FUNDECOR require several years to develop new approaches to short- and long-term conservation activities and to achieve self-reliance. In forestry projects based on introduction of new technologies, USAID project design also should analyze the need for continuing research support and, if appropriate, provide for such support.



This Evaluation Highlights, *by Phillip E. Church of USAID's Center for Development Information and Evaluation, summarizes the findings of CDIE Working Paper No. 205,* Forestry and the Environment: Costa Rica Case Study, *by Phillip Church, Robert Mowbray, Nora Berwick, and Roberto Martin, June 1994. Reports may be ordered from DISC, 1611 N. Kent Street, Suite 200, Arlington, VA 22209–2111; telephone (703) 351–4006; fax (703) 351–4039; Internet docorder@disc.mhs.compuserve.com. Editorial and production services provided by Conwal, Inc.*