THE PERUVIAN AMAZON: DEVELOPMENT OF TROPICAL TIMBER RESOURCES BY LOCAL COMMUNITIES

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MESSAGE FROM USAID

This CASE STUDY is a product of the Environmental and Natural Resources Policy and Training (EPAT) Project funded by the United Stated International Development (USAID). It is part of USAID's effort to provide environmental policy information to decisionmakers in developing countries. The objective is to encourage the adoption of economic policies to promote sustainable use of natural resources and to enhance environmental quality.

EPAT CASE STUDIES are written for development professionals and policymakers in developing countries who are responsible for establishing and implementing policies on the sustainable use of natural resources and for civil servants, project officers, and researchers who are directly involved in the implementation of development activities. This CASE STUDY describes the results of a USAID-funded project in the Peruvian Amazon's Palcazu Valley aimed at promoting local control of the development of tropical timber resources. Although the financial targets were not met due largely to premature withdrawal of USAID support, several policy lessons were learned. The project illustrated that sustainable timber production may be economically superior to converting tropical forests into cropland and pasture. Policymakers need to be more aware of the economic feasibility of alternative uses of tropical forest resources.

The contribution of USAID toward writing, printing, and distributing this document is estimated to be $4,000. Due to financial limitations from USAID, this document is being distributed on the Internet. Copies are available from the author. The availability of this paper is being announced to more than 2,000 policymakers and professionals in developing countries.

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THE PERUVIAN AMAZON: DEVELOPMENT OF TROPICAL TIMBER RESOURCES BY LOCAL COMMUNITIES

What are the challenges involved in applying the general principle of local control over the development of tropical timber resources? Some answers to this question emerge from studying a project, funded by the U.S. Agency for International Development (USAID), that involved natural forest management on indigenous lands in the Peruvian Amazon's Palcazu Valley. A financial analysis based on the results of recent harvests shows that the project's actual performance, after USAID support ended, has fallen well short of its projected potential [note 1].

Poor performance resulted from biased governmental policies and the premature withdrawal of outside technical experts because of guerilla activity of the Sendero Luminoso (Shining Path) terrorists. Aside from depending on policy reform, sustainable forestry development can be promoted by linking forest dweller communities with private sources of marketing, production, and processing expertise.

Local Control

Effecting local control in ways that truly favor sustainable development is easier said than done. The World Bank, like other donor agencies, supports projects only where there has been a "clear definition of the roles and rights of...forest dwellers (IBRD 1991: 66)." But because of ignorance, desperation, or greed, forest dwellers often sign contracts with loggers who build skidder trails and roads and fell trees with little regard for ecosystem recovery.

Even when local communities want to use and manage forests wisely, the means to do so are often scarce. Sustainable development of timber resources requires the preparation and application of environmentally-sound production and harvesting plans. Furthermore, marketing must be effective so that resource owners receive full value for standing timber; otherwise, conservation incentives are weak. Although forest dwellers' knowledge of their ecosystems is often intimate and sophisticated, few of them have the technical, administrative, and marketing skills needed for a successful market-based forestry venture. At the same time, local financial resources are often insufficient to pay for roads, equipment, and mills.

In 1983, USAID launched a project in the Peruvian Amazon's Palcazu Valley that addressed some of these obstructions to locally-controlled development of tropical forests. This Case Study describes its basic elements and examines differences between pre-implementation evaluations and actual financial performance of the project. Because of these differences, it is no great surprise that local communities abandoned the venture a few years after USAID ended support in 1989.

Setting and Background

Located northeast of Lima, the Palcazu Valley is typical of the western fringes of the Amazon Basin. Rainfall in the Selva Alta (high jungle) is heavy, averaging more than 6,000 mm a year. Except for narrow alluvial terraces alongside rivers descending from the Andes Mountains, soils have a low pH and are infertile and erodible.

For the most part, this environment is inhospitable to crop and livestock production, other than the slash and burn farming that has sustained indigenous populations for thousands of years. Nevertheless, agricultural colonization was the main thrust of central government policy for the Peruvian Amazon for many years.

President Fernando Belaunde, who held office from 1963 to 1968, was similar to other South American leaders of his time. He believed that if landless mountain and coastal peasants received land in the "under-populated" Amazon, it would stimulate the national economy and social conditions would improve (Belaunde 1965).

Belaunde returned to the presidency in 1980, replacing a military dictatorship that had held power for more than a decade. That September, he announced plans for the Pichis-Palcazu Special Project, which was to involve road construction, the establishment of wood-processing and other industries, and the settlement of 150,000 colonists in the Palcazu Valley and adjacent lands. Keen to support Peru's return to civilian government, USAID promised funding and technical assistance.

From the outset, the project met with fierce opposition from indigenous communities as well as anthropologists. Richard Chase Smith, who had worked for many years among the Palcazu Valley's Yanesha (Amuesha) Indians, was particularly effective at communicating the project's harmful social and environmental effects to national and international audiences (Smith 1982).

The USAID Project

Responding to these criticisms and the findings of its own consultants, USAID decided not to back colonization. Instead, it allotted $22 million, including $4 million for technical assistance and project development, to the Central Selva Resource Management Project. The project would set up and manage a protected reserve, develop and apply a system for sustainable timber exploitation, promote environmentally-sound crop and livestock production, and upgrade public health services.

People directly involved with the project's reserve management and agricultural activities have written descriptions about its implementation (Aguilar 1990, Staver 1990). The following discussion and analysis relate to the forestry component.

Timber resource development was innovative in at least three respects. First, it was to use novel production and harvesting techniques developed at the Tropical Science Center in San Jose, Costa Rica. Second, the project would process various wood products on-site. Third, the local community would help with all stages of the project, from planning through implementation.

Designing viable production and harvesting guidelines was challenging because knowledge of Amazonian ecosystems was, and continues to be, very limited. Most of the available literature consists of preliminary inventories of the region's enormous biodiversity. Very little research has addressed critical ecosystem functions and linkages. Accordingly, the interactions of logging and other disturbances and their effects on different habitats remain a matter of opinion.

Not being able to wait for a comprehensive scientific understanding of flora and fauna in the Palcazu Valley, Tropical Science Center consultants proposed that logging be done in narrow strips, no wider than twice the height of the forest canopy. After clear-cutting the strips to remove all timber more than two inches in diameter, trees would regenerate on their own.

Regeneration happens so rapidly that erosion would not be a great concern; also, a considerable amount of vegetation would be left in logging sites, providing soil protection.

There would be no replanting, and management would consist only of periodic thinning. Logging would occur on any particular strip once every 40 years. This means that loggers would harvest strips making up 1/40 of a forested tract each year. (The box on this page shows a sample 30-year plan.) The strips would not be adjacent to one another but would instead be scattered throughout the entire tract to promote regeneration (Hartshorn, Simeone, and Tosi 1986; Tosi 1986).

The appeal of this scheme is that it imitates nature in Amazon rainforests. Especially along the lower slopes of the Andes, storms, landslides, and tremors continuously open clearings. Seeds that have lain dormant under the canopy sprout to life. Other seeds are blown in by the wind and carried in by birds and other animals. New plants emerge very rapidly in these clearings. Any of the region's small abandoned fields or pastures confirms that forest regeneration is a powerful process in the western Amazon.

The plan to extract all timber wider than two inches represented a dramatic departure from standard practice in the Amazon Basin. Normally, loggers in eastern Peru cut down fewer than 10 mature trees from a hectare of primary tropical forest. Everything else remains, frequently in a damaged state because of careless felling and skidding practices. Industry sources report that regional extraction rates rarely exceed 15 meters cubed/ha. The sources also show that high-quality hardwoods, cut with chainsaws into crudely dimensioned boards, make up most of the output.

This pattern of forest exploitation makes sense where logging, transport, and processing costs are high. Electricity, for example, is much more expensive in eastern Peru than in other parts of the country. Since costly diesel-powered generators are the primary energy source in the Amazon, electricity prices average $0.20/kwh, compared to the national average of $0.05/kwh.

This means electricity payments can make up a fifth of wood processing costs.

Despite adverse economic conditions, Tropical Science Center personnel believed that investments in processing capacity were important to make their production and harvesting scheme work. Accordingly, they installed a small mill to make various wood products: treated utility poles and fence posts, charcoal, and the sawn lumber normally exported from the region (Simeone 1990). The national electricity company contracted to buy the poles and the Pichis-Palcazu Special Project agreed to purchase fence posts.

Another distinction of the Central Selva Resource Management Project forestry component was that it involved the close cooperation of indigenous communities. Administrators decided early on not to involve colonists, who had converted most of their respective holdings to pasture and cropland already and who lacked the social cohesion of the Yanesha. Work with that group began with participatory land use capability assessments. These efforts led to the democratic adoption of plans to extract timber from some forests and to dedicate other forests as reserves (Simeone 1990).

Local confidence in the Management Project's forestry activities was strong in spite of linkages between the USAID project and the governmental Pichis-Palcazu Special Project (which continued to promote colonization in a limited way). That strong confidence was visible in the serious attempts made by the Yanesha Forestry Cooperative, Ltd. to continue the Tropical Science Center system after USAID support for field activities ended in 1989. USAID's withdrawal was a response to Shining Path guerilla activity near the Palcazu Valley but not among the Yanesha. In 1991, loggers harvested five forest strips, averaging about a hectare each, and sold sawn timber and other products.

Financial Results

Reflecting on the forestry activities he carried out with the Yanesha Forestry Cooperative, Simeone (1990) observed that many years of outside technical assistance would be vital for production, harvesting, milling, and marketing efforts to succeed. Poor performance of the system in the years immediately following the end of USAID support proved this conclusion correct.

Early evaluations of the forestry component had been encouraging. Using USAID and other data, Elgegren (1993) estimated a base-case rate of return on invested capital of 20%. He also found that profitability was especially sensitive to changes in output prices and unit production costs. However, variations in output levels did not have as much of an impact on rate of return.

Profitability was reduced because USAID rules required the purchase of American equipment that did not always suit the small Palcazu Valley operation. On the other hand, rate-of-return estimates perhaps were too high. They were based on the assumption of a 40-year harvesting cycle, which might have proven to be optimistic.

Evaluation of actual Forestry Cooperative performance, after USAID-supported technical assistants left, shows that the project did not meet expectations. Elgegren (1993) visited the cooperative twice in 1992 to collect data required for evaluation. Recorded in the cooperative archives were all harvesting, processing, and marketing operations for 1991, when the group used the Tropical Science Center harvesting system without direct USAID support. Elgegren also reviewed records from the local office of the Peruvian national forestry service and from a national environmental organization involved in the project. Interviews with loggers and wood-buyers in the region provided additional data and insights.

Significantly, average revenues in 1991, $5,491.83/ha harvested, were below costs of $5,614.89/ha for harvesting, skidding, and manufacturing (Elgegren 1993), partly because of low prices. On average, hardwood boards, accounting for 40% of total production, sold for $88.98/meters cubed locally and for $135.59/meters cubed in Lima. These prices were well below values at the Peruvian border, which exceeded $500/meters cubed at the time (see the box on this page).

There are several explanations for the low prices the cooperative received for its timber. Quality was uneven and marketing could have been better. For example, a United Kingdom buyer complained that there was too much empty space in shipping containers.

In addition, public policy helped depress timber values. Throughout Latin America, discriminatory macroeconomic and trade policies have weakened incentives to produce wood and other primary commodities (Krueger, Schiff, and Valdes 1988). By the early 1990s, in contrast to other countries, Peru was not regulating or taxing the export of unprocessed lumber. However, exporters had to deposit foreign currency earnings with the Central Bank and then wait for several weeks for exchange into

Peruvian soles at rates set at the time of deposit. During 1991, when Peru suffered one of the highest rates of inflation in Latin America, this arrangement amounted to a 14 to 68% tax on exports. Businesses who sold wood overseas show that the deposit obligation cut 1991 revenues 30 to 35%.

Depressed revenues also resulted from low production. Experience in the Shiringamazu Native Community, a member of the Forestry Cooperative, is a good example. In 1991, Tropical Science Center-style recovery took place there on three strips, with a combined area of 2.87 ha. Overall yields, which approached 45 meters cubed/ha, were three times that of normal logging practices. However, most of the difference came from utility poles, 55.40 meters cubed/ha, and fence posts, 188.85 meters cubed/ha, manufactured from smaller timber. Production of sawn tropical hardwood only amounted to 18.68 meters cubed/ha (Elgegren 1993). Besides being only a small increase over standard extraction techniques, the latter yield compared poorly with standing timber suitable for milling. It usually exceeds 50 meters cubed/ha in places like the Palcazu Valley.

Using the firm's data, and taking into account all capital, operating, and maintenance expenses, Elgegren (1993) calculated that losses from the traditional system would amount to just $34.57/ha.

Apparently aware of the financial advantages of usual selective extraction, the Forestry Cooperative applied standard practices on some land at the same time that it harvested strips according to Tropical Science Center guidelines. For example, only 46% of its timber for sawmilling actually came from strips. The rest was obtained using common logging techniques.

The latest news from the Palcazu Valley is that indigenous communities are negotiating with local loggers to operate on their lands. Those communities' experiment with the Tropical Science Center system has ended, at least for the time being.

Policy Lessons

Abandonment of the Central Selva Resource Management Project does not mean that the efforts of USAID, its contractors, and the Yanesha Forestry Cooperative were futile. In particular, the regeneration that is occurring on harvested strips suggests that the Tropical Science Center production and extraction scheme has promise. The harvesting of smaller timber was less successful, mostly because sales of utility poles to the national electricity company and of fence posts to the Pichis-Palcazu Special Project never fully materialized. The most serious shortcoming of the Management Project, though, was the low recovery of valuable tropical hardwoods.

As in many other Latin American countries, resource owners' reluctance to invest in methods to use a larger portion of their timber has much to do with public policy. If exporters could choose when to convert their foreign earnings into domestic currency, then domestic prices for lumber would not have been as low and incentives to improve harvesting and processing efficiencies would have been stronger.

The Tropical Science Center system would have been more profitable than alternative land uses if wood values had not been artificially depressed. Suppose, for example, that payments received by the Forestry Cooperative in 1991 had been 40% higher ($7,700 instead of $5,500/ha). Without efficiency improvements in timber extraction or milling, average annual income on a 40-ha site, with a 40-year Tropical Science Center-style rotation, would have been $52.50/ha (1/40 of the difference between $7,700 and $5,500). At an interest rate of 10%, the present value of maintaining this income level indefinitely is $525. This amount is about two-thirds greater than average farmland values in and around the Palcazu Valley (Elgegren 1993).

We need to consider something else in an economic analysis of the Tropical Science Center system. Wild game is an important source of protein for the Yanesha. Their hunting success appears greater, and animal populations increase, when there are periodic small clearings such as the harvested strips.

Although the Tropical Science Center system seemed to have considerable merit, it was difficult to apply without outside technical assistance. The 1991 forestry efforts in the Palcazu Valley clearly shows that forest dwellers' willingness to use and manage resources sustainably is not enough. To receive full market value for their timber, they require substantial help with production, harvesting, marketing, and processing.

What is the most reliable source for outside help? Latin American timber owners cannot count on support for forestry development from the public sector. As the record of socialized forestry in places like Honduras and Venezuela shows, governments have experienced the same difficulty in developing natural resources as they have in running airlines, steel mills, and other enterprises.

Total dependence on development agencies is also not appropriate. Few donor projects last as long as it takes for a tree to mature. Unforeseen circumstances such as the guerilla activity of the Shining Path terrorists can force a project's termination. Even so, it would have been noteworthy for the Central Selva Resource Management Project to survive 15 years. Unless development agencies succeed in providing local communities with all the capital and expertise required for sustainable forestry development, involvement of the private sector is unavoidable.

Tapping into private firms' production, harvesting, processing expertise, marketing contacts, and capital can be difficult. Even if public policies do not discriminate against the forestry sector, a business will hesitate in becoming a partner with a local community if the community is fragmented or unstable.

Some environmentalists also categorically oppose private sector involvement in developing tropical timber resources. Opposition can spring from an unrealistic hope that they can permanently halt logging or from a misunderstanding of how public policies influence logging company decisions to manage renewable resources.

Those concerned about the future of tropical forests in places like the Peruvian Amazon should welcome initiatives like the Central Selva Resource Management Project. The project shows that sustainable timber production may be economically superior to converting tropical forests into cropland and pasture. However, timber production is viable only if it is possible to eliminate government policies and public sector practices that depress timber values.

Furthermore, we must find ways to involve the private sector in sustainable forestry development through joint ventures that serve the long-term interests of both companies and local communities. If we can harness private marketing, production, and processing expertise, the profitability of ventures like that in the Palcazu Valley should improve considerably. Then prospects for forest conservation will brighten in many parts of the Amazon Basin.

NOTE

1. An earlier version of this paper was published in the COMMONWEALTH FORESTRY REVIEW Vol. 74(2), 1995. We are indebted to the editor for permission to reproduce it here.

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