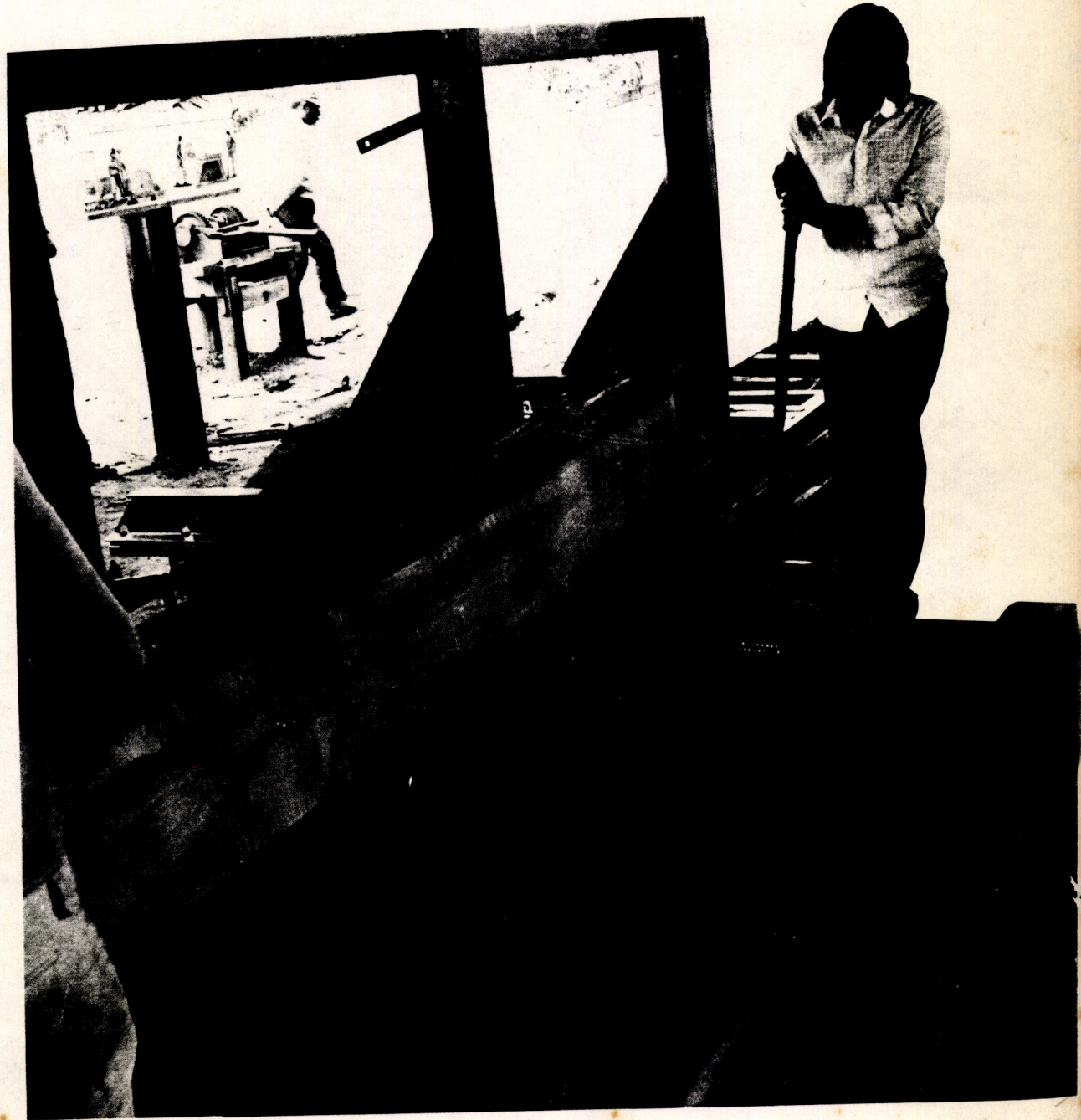


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# THE AYOREODE-ZAPOCO COMMUNAL SAWMILL: A SOCIAL FORESTRY PROJECT IN EASTERN BOLIVIA





"We lived contented in the forest. When we were put in a mission village, it was a world we did not understand: houses, clothing, new kinds of food. Everyone felt a great longing for the life we had lost. The missionaries gave us medicine, but more of us died than before. Our teeth fell out, and our women and children withered. There is no return. But where is our road going?"

This is how one Ayoréode Indian described the abrupt transition his clan had to make when their lives as hunter-gatherers ended just 30 years ago. Since then, the number of Ayoréode has decreased by about 60 percent—and rapid boom-bust colonization has laid waste to over 50,000 hectares of forest in the lowland department of Santa Cruz, Bolivia. Recently, anthropologist Shelton Davis visited the remote village of Zapocó to see how one group of Ayoréode are trying to renew their culture—by protecting and selectively harvesting the forest resources around them.

## SHELTON H. DAVIS

**T**ropical forests and the Indians who live within them both suffer when bulldozers plough through virgin lands. The Indians can often do little more than silently witness the forests coming down. But in a remote region of Bolivia, Indians themselves are now running a sawmill.

This rudimentary mill is owned and operated communally by the Ayoréode

Indians\* of the village of Zapocó in the province of Nuflo de Chavez, Department of Santa Cruz. The Ayoréode, who once lived an independent existence as nomadic hunters and gatherers in the forests of the eastern Chaco, today number less than 2,000 people and live a miserable settled existence at scattered mission stations in eastern Bolivia and northern Paraguay. Zapocó is one of these Indian mission stations, founded by the South American Mission in the late 1940s and now the home of approximately 140 Ayoréode and 30 Chiquitano Indians (a neighboring indigenous group). With their long black hair, their decaying teeth, and their ragged clothing, the Ayoréode are easy to recognize as one of the poorest, most culturally depressed indigenous groups in the eastern lowlands of Bolivia.

Since 1982, the Inter-American Foundation has been financing their sawmill development project. Although relatively inexpensive (approximately \$120,000 over a two-year period) and small in scope (reaching a community of less than 200 people), the project takes on special significance for development planners who are interested in creating ecologically sustainable development for the tropical lowlands of South America.

A group called Ayuda Para El Campesino del Oriente Boliviano (APCOB), aiding more than 40 Indian groups of eastern Bolivia, is the actual grantee for the Ayoréode-Zapocó communal sawmill. The project also forms part of a

larger program of inter-ethnic economic cooperation and indigenous land-and-resource protection being promoted by the Central de Pueblos y Comunidades Indígenas del Oriente Boliviano (CIDOB), an indigenous federation founded in 1982. Its purpose is to demonstrate that indigenous groups of the tropical lowlands can preserve and protect their natural resources while simultaneously developing self-sustaining and self-managed local economies.

Early in 1985, I spent 16 days assessing the social and economic impact of the Ayoréode-Zapocó communal sawmill. Like so much else in Bolivia, I found that the evolution of this small rural development project was subject to the larger political and economic problems of contemporary Bolivian society (see Kevin Healy's "On the Road in Rural Bolivia" in *Grassroots Development*, vol. 9, no. 1). Yet, there are also some unique features—not the least being that it is operated by a group of forest Indians who, only a few decades ago, were nomadic hunters and gatherers.

## INDIGENOUS PEOPLES AND THE NATIONAL FORESTRY LAW

APCOB was established in 1978 by a small group of anthropologists and linguists who had carried out research in the Bolivian Oriente, and wanted to help the indigenous groups to adapt to national society while respecting their cultural identities. Although their work began with much idealism, they were aware of the difficult problems faced by

Log being planed at Ayoréode-Zapocó communal sawmill.

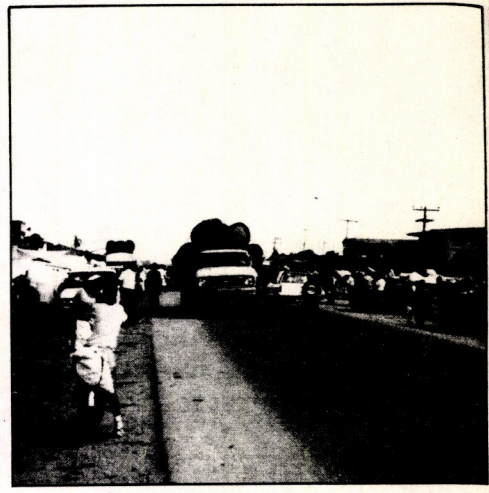
\*The tribe has several names, including Samucoces, Zamucos, Morotocos, Potureros, and Guarañocos. The people of Zapocó call themselves Ayoréode.



Corduan Joeller



Ayoréode women and children outside "one-room house" in Zapocó.



Commercial logging truck on outskirts of Santa Cruz.

indigenous groups trying to relate to Bolivian society without losing their own identity.

The Indians of the eastern lowlands are scattered over an immense geographic area, do not understand each other's languages, exist in various stages of acculturation or contact with national society, and number over 130,000 people. Most important, the great surge of agricultural, petroleum, and natural gas development that has taken place in Santa Cruz during the past decades has had a dramatic effect on social and inter-ethnic relations in the region.

On the one hand, thousands of Quechua-speaking Indians from Cochabamba and other parts of Bolivia have migrated to Santa Cruz as seasonal or permanent farm workers on new sugar and cotton plantations or as settlers in state-sponsored colonization projects. On the other hand, indigenous tribal groups from the region—such as the Ayoréodes, Guarayos, Chiquitanos, and Chiriguanos of Izozog—have found their traditional homelands and ways of life threatened by new roads, cattle ranches, and resource development projects.

In addition to their economic marginalization, these indigenous groups (unlike the larger and more powerful Aymara- and Quechua-speaking Indian groups of the highlands) find their traditional lands and communities without any legal recognition or protection from the Bolivian State. The Bolivian Agrarian Reform Law of 1953, for example, focuses almost exclusively upon land tenure problems of indigenous peasants in the highlands and contains few provisions

for protecting the land rights of the more-dispersed indigenous tribal groups in the lowland areas. Those few sections of the law that do refer to the lowland indigenous tribes describe them as jungle-dwelling groups living in a "savage" condition and possessing a "primitive" level of social organization.

"In general," as Jürgen Riester, the founder and current Director of APCOB, writes, "the Bolivian legal system not only does not promote the autonomous development of the lowland Indian groups, but it specifically accepts the tutelage of private institutions and protection by the state. There are no legal mechanisms which permit or encourage the independent development of Indian communities."

The problems that the lowland Indian groups face in controlling their lands and resources, and hence in being ensured some possibility of autonomous and independent development, are clearly reflected both in the General Forestry Law passed in 1974 and a law governing wildlife, national parks, hunting, and fishing passed in the following year. Although these laws contain conservation provisions, they provide only limited recognition of Indian rights to the fish, the wildlife, and to forest resources.

The 1974 General Forestry Law, for example, contains no provisions for indigenous control of timber resources in tribal territories. Nor does the law contain any provisions for indigenous peoples to independently manage and develop their forestry resources. To the contrary, the law merely states that the Center for Forestry Development (which is charged with managing, protecting,

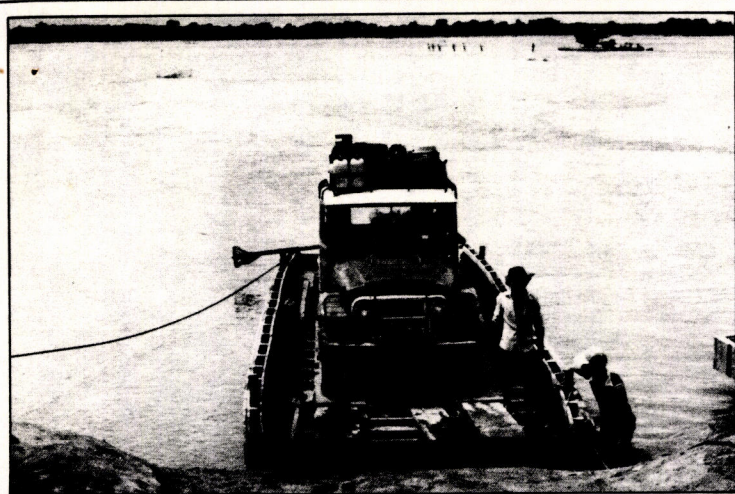
and developing the forest patrimony of the country) will train and hire *individual* Indians as tree cutters and forest guards.

Since the mid-1970s, the Bolivian Center for Forestry Development has been ceding large areas to private companies for forestry development with little concern for the interests of the native inhabitants or the preservation and protection of forest resources. Despite legislation calling for such actions, few private lumber companies have utilized forestry management, selective tree-cutting, or systematic reforestation. The general practice in eastern Bolivia, and throughout most of lowland South America, is for private lumber companies to clearcut the forest as the quickest way to make profits. Many companies also send out hunters to kill game to feed workers, thus destroying the wildlife upon which many indigenous groups depend.

Prior to the establishment of the sawmill, the Ayoréode of Zapocó were working as loggers for private companies and other institutions (e.g., the Vicariate of Ñuflo de Chavez) who were licensed to exploit the rich timber resources on tribal lands. In fact, it was not until APCOB offered to assist the Ayoréode in the establishment of their own communal sawmill that the Indians conceived of processing their own timber for commercial purposes. Although the Ayoréode have a sophisticated knowledge of the environment, they possess no framework to protect, manage, and develop their forests.

A major objective of the communal sawmill is to demonstrate to state agencies, like the Center for Forestry Development





Communal sawmill's jeep being ferried across Rio Grande during flood stage of rainy season.



Guido Vega and Rosas Cuellar (in the row) and men from the sawmill work

opment, that indigenous communities can commercially develop their forest resources without destroying the forest. For this reason, the APCOB staff has directed much effort toward teaching the Ayoréode to conduct forest inventories, to select only mature trees of certain species for cutting, and to initiate a program of integral forest management and reforestation. As Nohaine Picanerai, one of the Ayoréode leaders, told me on my first day in Zapocó, "We are the only Indians in eastern Bolivia who have a sawmill, and we are caring for it so our children and the forest where we live can benefit and thrive."

### THE AYOREODE-ZAPOCO COMMUNAL SAWMILL

Two things immediately strike the outside observer about the Ayoréode-Zapocó communal sawmill. The first is its general isolation from the social and commercial centers of Bolivia. Not only is the sawmill located in one of Bolivia's major frontier areas, it is also situated in one of the most isolated parts of this frontier. During the rainy season, it takes from 15 to 18 hours to reach Zapocó by jeep. Only the first hour of this journey is over a paved road—the remainder is over a dirt road through mountains and jungle. At the end of the road stands Zapocó. There one finds a large water tower built by the Mission; a screened-in house that formerly housed a North American missionary family and that now houses the APCOB staff; the Indians' disordered array of small wooden and thatched houses; and the

sawmill and its lumberyard, garages, and workshops.

The second impression one has is the strong commitment of the APCOB staff to the Ayoréode people and the sawmill project. Three APCOB staff members work with the Ayoréode project and live in Zapocó most of the time: project coordinator Guido Vega, project forester Rosas Cuellar, and project mechanic Guillermo Antelo. These three men have an enormous respect for the Ayoréode people and their culture, as well as a desire to protect the endangered forests of Bolivia. As former field employees of the Center for Forestry Development, Guido Vega and Rosas Cuellar have walked through much of eastern Bolivia, spending weeks surveying and measuring protected areas. They have seen the environmental damage caused by the lumber companies and are convinced that the Ayoréode project will provide a model for a socially and environmentally sound forestry development policy.

During the first year after the project's establishment, the APCOB staff worked to provide the Ayoréode with the technical, organizational, and administrative skills needed to operate and manage the communal sawmill. First, Guido Vega and Rosas Cuellar conducted a survey of forestry resources in the area of Zapocó. This survey included an inventory of all commercial tree species on Ayoréode lands, the demarcation of the land area possessed by the Ayoréode community, and an assessment of the scope of previous logging. Once they had this information, the Ayoréode applied to the Center for Forestry Development for a license to develop the forestry resources of the

area.

APCOB hired a master sawmill foreman to organize the mill's first two years of operation. The foreman assisted staff in teaching the Ayoréode all skills associated with the cutting, transportation, and industrial transformation of timber. The sawmill workforce was organized into two rotational monthly shifts of seven men each. Each shift, there is an Ayoréode foreman who has been taught to use, manage, and repair the machinery. One Ayoréode youth has learned the skills to administer the sawmill, including how to ensure cut timber and processed wood. Two other youths have learned to drive and repair the project tractor and truck.

Finally, the APCOB staff has conducted a series of training workshops on chainsaw use and maintenance, mill operation and administration, natural resource protection, accounting, adult literacy, and nutrition. The courses on use and maintenance of chainsaws and the operation and administration of the sawmill have proved so successful that they are now being attended by other lowland indigenous groups. In fact, as a result of their participation in the courses, the neighboring Chiquit communities of Lomerio are formulating their own plans to establish a sawmill in order to exploit the rich timber sources on their lands.

### THE SELF-MANAGEMENT COMMITTEE

From the beginning, APCOB was interested in making the sawmill a





Stripping bark from log at communal sawmill. The master foreman is third from right.



Preparing a log for planing.

managed and economically viable enterprise under community control. Initially, APCOB thought that within five years the project could be fully controlled and administered by the Ayoréode. While the project staff remains committed to this goal, they are now more realistic about the difficulties involved in placing the sawmill completely in Ayoréode hands, particularly given the lack of basic accounting, management, and literacy skills among the indigenous population, and the factional rivalries that exist in Zapocó. In the summer of 1984, however, an event occurred that accelerated the process of Ayoréode self-management.

At one of Zapocó's nightly village assemblies, Chinoi Picanerai, a Protestant pastor and one of the village leaders, accused Mario Picanerai, the project tractor driver, of using the tractor for his own needs rather than for the benefit of the community. Chinoi Picanerai also accused Guido Vega, the APCOB project coordinator, of deceiving the community by claiming that "the truck is ours" (i.e., that it actually belonged to the community). Chinoi and one of his allies, a Chiquitano pastor and school teacher, were angry that the project would not let them use the truck to carry corn from neighboring communities.

The dispute raised the issue of how to balance the conflicting demands of the project with the consumer and transportation needs of the local Indian community. Later, in traditional Ayoréode fashion, another meeting was called, and Chinoi apologized to Mario and the APCOB staff for his accusations and asked for their forgiveness. As a result of

this second meeting, the APCOB staff suggested that a formal self-management committee be organized and that an *acto* (a set of bylaws) be drafted to define its functions.

According to the *acto*, drafted in November 1984, the self-management committee signs all contracts concerning the functioning of the sawmill, plans the sawmill's work schedule and activities, resolves problems that arise in the use of sawmill property, makes monthly reports on the sawmill, and sets wages for the opening of roads and the cutting of logs. It is hoped that the self-management committee will eventually take over full management of the sawmill, leaving only technical assistance and training programs in the hands of the APCOB staff.

By early 1985, the self-management committee was fully involved in planning the work and production schedule for the sawmill and in processing the papers needed to obtain annual permission from the government to cut timber. Although it is still impossible to predict whether the sawmill will become a totally autonomous enterprise, there is no doubt that establishment of the self-management committee is a positive step in this direction.

#### SOCIAL, ECONOMIC, AND CULTURAL IMPACTS OF THE SAWMILL

The Ayoréode have responded positively to the sawmill because of its favorable social, economic, and cultural impacts. Surely, the major impact of the mill

has been upon employment opportunities and income in Zapocó. Prior to the sawmill, the only salaried positions in Zapocó were those of the schoolteacher and the caretaker of a community cattle herd, both of whom were paid by the South American Mission. The only other ways that the Ayoréode could earn money were through seasonal contracting with local ranchers or timber companies or by cutting wood from their own forests for the Vicariate.

Fifty of Zapocó's 52 men earn income from the sawmill and its associated activities (the other two are elderly and receive a stipend). In December 1984, for example, the seven plant workers, the sawmill administrator, tractor driver, and trucker's assistant earned a total of 9,680,000 Bolivian pesos (approximately \$675). Between July and December 1984, those employed in opening roads and in logging earned a total of 6,000,962 pesos (approximately \$420). Although in terms of purchasing power after inflation the total income was not significant, it marked an appreciable contribution to individual household incomes and community welfare.

Of equal importance is the impact the sawmill is having on other aspects of Ayoréode life. In the organization of the sawmill, the APCOB staff decided the forestry project should not compete with food-producing activities (the Ayoréode produce rice, yucca, camote, maize, platanos, papaya, and sugar cane in small family gardens). During the 1983-84 agricultural cycle, 20.4 hectares of garden crops were cultivated in Zapocó. With the technical assistance of APCOB, the community planted 28.5





Subsistence farming is encouraged, but the short rainy season limits rice production.



Ayoréode woman and an elder, who receives a stipend from the mill, dressing a hide.



Scrap wood from the mill is used to build and enlarge houses.

hectares during the 1984–85 agricultural cycle—an increase that should appreciably improve the diet and health of the Ayoréode population.

The APCOB staff has also begun to work with the Ayoréode women. Ayoréode women play a vital role in the domestic economy as producers of traditional baskets, nets, and skirts, as collectors of fruits, palms, and edible and medicinal plants, and as gardeners alongside their husbands. Although the project staff has accepted the traditional division of labor by not employing any women in the sawmill or for related forestry work, it supports them in the production and sale of artisan products by marketing their crafts at a cooperative store in Santa Cruz.

The sawmill has also had a positive impact on Zapocó's housing. A 1983 census found that nearly two-thirds of Zapocó's houses had only one room (usually with a straw roof and dirt floor) that was also used for cooking and served as a chicken coop. With the sawmill, a house-construction and renovation boom is now occurring. Scrap wood is used to build and enlarge houses and for adding on chicken coops, fences, and kitchens. In addition, APCOB brought in a mason to teach the community to make clay bricks and roof tiles in a recently constructed kiln.

Like most rural communities in Latin America that have recently had some access to modern medicine, the Zapocó population is young. More than 50 percent of the population is less than 25 years of age, and the sawmill has provided employment so they can remain in their natal village. The average age of

persons employed in the sawmill is 23, and more than 60 percent of those employed in road-work and logging are between 15 and 25 years of age.

For many of these youths, the work in the sawmill and related forestry activities appears to fill a psychological and cultural void left by more than 30 years of mission dependence and the suppression of hunting, warfare, and other traditional Ayoréode male activities. The spirited way in which Ayoréode youth approach their work in the sawmill recalls the independence and pride that characterized young males in the traditional culture. A new Ayoréode male identity may be forming that culturally defines success as one's ability to work in the sawmill, drive a truck or tractor, or operate a chainsaw.

Finally, the short-wave radio used by the project staff is broadening the social and cultural universe of the people of Zapocó. Every morning, a group of Ayoréode gather in front of the short-wave radio at the mission house to communicate with or hear news from the APCOB headquarters in Santa Cruz or from other areas of the department where APCOB has rural development projects. This daily radio communication yields valuable information on such diverse topics as road conditions, commodity prices, training courses and conferences, the condition of a sick child at a hospital, the status of negotiations for credit with a government agency, or any number of other subjects. It is exactly this expanding social network that may, in the long run, determine the economic viability of the Ayoréode's experiment in operating and managing a modern sawmill.

## THE ECONOMIC PERFORMANCE OF THE SAWMILL

In contrast to the positive effects the sawmill is having on the social and cultural situation of the Ayoréode, the economic performance of the sawmill is more difficult to assess. The 1984 Bolivian inflation rate of 2,000 percent and the continued instability and drastic devaluation of the peso make it almost impossible for any enterprise to be profitable or conduct rational economic planning. These problems are exacerbated by Zapocó's serious transportation and marketing difficulties as well as a general lack of entrepreneurial and managerial experience on the part of the Ayoréode. Given these factors, the Ayoréode-Zapocó communal sawmill should be judged as much by its ability to survive the current economic crisis as by standard economic measures of profitability.

It is instructive to look at the actual economic performance of the sawmill in the 1983 and 1984 production cycles. According to APCOB data, the sawmill not only failed to produce enough transformed wood to cover operating costs, but there was a decline in production and a widening deficit. In 1983, APCOB projected the sawmill would need to produce 105,321 board feet (b.f.) of lumber to break even. In actuality, the sawmill only produced 98,321 b.f.—a deficit of 7,000 b.f. The following year, APCOB projected a production quota of 114,480 b.f. to break even, but the sawmill only produced 65,000 b.f.—a production deficit of 49,480 b.f.



While absolute figures have little meaning, a similar trend is reflected in comparisons of annual income from lumber sales as a proportion of total project and sawmill costs for 1983 and 1984. Income from lumber sales as a proportion of total project costs dropped from 14.7 to 8.05 percent between 1983 and 1984, while income from lumber sales as a proportion of sawmill costs dropped from 34 to 26.05 percent. In other words, not only did the Ayoréode-Zapocó communal sawmill fail to cover costs, its deficits, in terms of both production and income, actually increased during its first two years of operation.

Yet neither the Ayoréode project staff nor the APCOB accountant are surprised by the sawmill's poor initial performance. They attribute the poor economic performance to the general economic situation of Bolivia; the emphasis on skills training during the first two years of sawmill operation; and the late formation of the self-management committee, which is central to the long-term economic viability of the project. The APCOB staff has analyzed the production problems and believes that the sawmill will soon be able to cover at least 75 percent of its costs.

The APCOB staff also realizes that transportation problems must be resolved if the sawmill is to be a self-sustaining economic enterprise. The project truck, for example, made only five trips with finished lumber to Santa Cruz in 1984, although it was estimated 48 such trips were needed for the sawmill to break even. The project staff responded by using CIDOB's truck to carry lumber from Concepción to Santa Cruz. Private truckers, when available, have also been contracted.

The APCOB staff has tried to help the Ayoréode understand these economic problems by designing a simple, culturally appropriate accounting system. This system converts economic forecasts and production quotas for the enterprise into values expressed in b.f., rather than in pesos. The capital costs of the sawmill in this system, for instance, are estimated to be 117,800 b.f. Given that the Ayoréode have agreed to pay 50 percent of the capital costs (58,900 b.f.) over a 10-year period, it is estimated they would need to produce and sell 5,890 b.f. annually between 1984 and 1994 to cover their share of capital costs.

The APCOB staff has developed a similar system of conversion to describe

the sawmill's production problems. For example, the Ayoréode have been told they would have needed to cut 566 cubic meters of tree trunks or 120,000 b.f. of lumber in order to cover production and other costs during 1984. Actual trunk production (264 cubic meters) was only 46.6 percent of this amount, leaving a production deficit of 53.4 percent.

In terms of smaller production units, the project staff estimates that at least 1,000 b.f. would need to be processed at the sawmill each day or 20,000 b.f. per month for the enterprise to cover production costs. By expressing values in these terms and by setting realistic production quotas, the APCOB staff believes the Ayoréode will gear productive efforts to collective rather than personal or household needs.

Additionally, APCOB hopes to resolve the economic performance problems of the sawmill by gearing marketing efforts to the larger regional commercialization program being developed by CIDOB. Since its founding in 1982, CIDOB has been promoting regional inter-ethnic cooperation to counter the economic marginalization and exploitation Indians face in the Department of Santa Cruz. The key elements of this scheme are the formation of local cooperatives among indigenous ethnic groups, the collective ownership of trucks, the sharing of market information, and an evolving program of inter-ethnic economic planning and technical training to be carried out in collaboration with the APCOB staff.

Currently, CIDOB is planning to extend the scale of its regional commercial concept to the marketing of forestry as well as agricultural products. The regional indigenous federation has recently purchased a parcel of land in Santa Cruz on which it will build a lumber warehouse, a wholesale store for the federation's *centrales* and indigenous communities, and a mechanics workshop for repairing vehicles and giving training courses.

This plan is particularly important for the Ayoréode. It will enable them to store and market their lumber along with other indigenous groups who are contemplating similar social forestry projects. The project will also provide a source of wholesale goods for the local consumer cooperative and provide a partial solution to the sawmill's trucking and transportation problems.



The community education program uses posters to illustrate timber production and marketing. The bottom facsimile is written Ayoreode.



## AN ALTERNATIVE MODEL

Concern about tropical forest management and development has grown in the face of persistent warnings about the dire social and environmental consequences of widespread tropical deforestation. Some sources indicate that as many as 27 million acres of tropical forest—an area about the size of New York State—are being cleared annually for agriculture and other forms of development. In Latin America, which contains more than half of the world's tropical forests, more than 100,000 square kilometers are being converted every year, and in Central America only one-third of the original forest cover remains. Scientists predict that, if these trends continue, the world will lose much of its genetic diversity since tropical forests contain over 50 percent of the earth's animal and plant life. They warn of serious erosion and watershed damage, of significant changes in climate and in the amount of carbon dioxide in the earth's atmosphere.

Last July many of these issues were raised at the World Forestry Congress held in Mexico City. The Congress was attended by 2,200 delegates (more than half Latin Americans) from 105 countries. It focused attention on the urgent need for action to protect and rationally utilize the world's endangered tropical forests.

One of the keynote speakers at the Congress was the president of the Inter-American Development Bank, Antonio Ortiz Mena. He stressed the important contribution that natural resources, like forests, make to the development process in Latin America. Forests, he noted, provide vital raw materials, energy, river basin protection, and many other benefits. Yet, too often in the past, development has damaged the region's natural resources. Mr. Ortiz Mena added that they must be utilized carefully, "not only to prevent their waste but also to ensure development for future generations of Latin Americans."

In line with modern ecological thinking, the IDB president termed as "erroneous" the widespread assumptions that nature's resources are limitless and inexhaustible, that their loss through environmental deterioration is a small price to pay for economic growth and the evolution of society. "We must try to achieve harmony between the human and natural orders," he said, "which will

undoubtedly increase the pace of social progress and enable us to leave an adequate ecological legacy to future generations, which have the same right as we do to use nature's patrimony."

Mr. Ortiz Mena went on to note that Latin America has the largest area of forests per person in the world and that "one of the greatest technological challenges facing humanity today" is the protection and careful utilization of this forest patrimony. The IDB's Forestry and Fisheries Section has already made loans of \$715 million for 35 forestry development projects and is willing to increase its lending to meet this challenge.

Interestingly, indigenous groups throughout the lowlands of South America—many of whom were the victims of previous land clearance and colonization programs—are also searching for development strategies that respect their cultures, conserve natural resources, and provide for the long-term sustainability of human populations and the environment. The terms "ethno-development" and "eco-development" have been coined by anthropologists, environmentalists, and native peoples to describe these culturally and environmentally appropriate models of development.

Although it is still in a demonstration or experimental stage, the Ayoréode-Zapocó communal sawmill provides one of the rare examples of such a model by a lowland indigenous population (see, also, the Panamanian Kuna forestry protection and scientific tourism project described in "Conservation Kuna Style" by Patrick Breslin and Mac Chapin, *Grassroots Development*, vol. 8, no. 2).

In my introduction I suggested that the Ayoréode-Zapocó communal sawmill, despite its relatively small size and limited social impact, may hold wider lessons. Clearly, one of the major lessons of this project is that state agencies and private companies are not the only institutions with the capacity to develop tropical forest resources. With limited capital and adequate technical assistance, local indigenous communities can commercially develop their forestry resources, manage them on a sustained yield basis, and contribute to national goals of social progress and integral rural development.

The Inter-American Foundation will continue to assess the Ayoréode-Zapocó project in future years, especially as a strategy for other indigenous groups

who live in lowland tropical areas of South and Central America. The Foundation, along with institutions such as the Inter-American Development Bank, must try to ensure that the indigenous peoples are more consciously and fully included in national forestry development programs. In a way, it is a question of "self-interest."

Some years ago, the environmental writer Norman Myers addressed the issue of responsibility for tropical deforestation by saying "Everyone's hand is on the chainsaw." The Ayoréode-Zapocó communal sawmill, while an embryonic venture, shows that indigenous populations can teach us much about using chainsaws. In their recent forest inventory, the Ayoréode discovered 30 types of trees, some very exotic. They decided to treat these rare and "expensive" trees as a savings account—to be used only when income was badly needed, and never all at once. By taking a more balanced approach to development and by relying more heavily upon the people who live in these areas, we may still be able to preserve the world's threatened tropical forests and ensure that they remain a bountiful resource for future generations.

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