

Developing the Mbaracayú Biosphere Reserve, Paraguay: Chiripá Indians and Sustainable Economies

Richard K. Reed

*Department of Sociology and Anthropology
Trinity University
San Antonio, Texas 78212*

Abstract

This paper explores the possibility of integrating Chiripá Indians into the resource management of a biosphere reserve in eastern Paraguay. Recent research shows that indigenous peoples carefully manage the flora and fauna of Latin American tropical forests. Conservationists working to protect tropical forests now recognize that removing these native peoples would alter the environments they seek to protect. In Paraguay, consequently, Chiripá systems of production and resource management are being integrated into environmental management plans to protect one of South America's last subtropical deciduous forests. This case is of special interest in that, in addition to producing their subsistence, the Chiripá have developed systems of sustainable commercial extraction of forest resources.

Key words: *biosphere reserves, agroforestry, Guaraní, Paraguay.*

INTRODUCTION

The low hills of eastern Paraguay's Mbaracayú region are covered by the last extensive subtropical forest in South America.¹ The region, defined by the drainage basin of the Jejuí River, harbors a diverse biome, resulting from its transitional position between temperate and tropical zones and its location on the western escarpment of Brazil's Paraná Plateau. In addition to its flora, the region is important for the diversity of its fauna, including unstudied species and endangered mammals, such as the giant armadillo (Hill and Hawkes 1983). The forest is also the home of over 5,175 Chiripá Indians, remnants of a much larger population that once stretched across southern South America from the eastern foot of the Andes to the Atlantic Ocean (INDI 1982). Although greatly reduced, these remaining groups continue to practice their traditional hunting, gathering, and shifting agriculture in the dense forest.

The forests and indigenous communities of eastern Paraguay are being destroyed by rapid economic development. Ranching, commercial agriculture, and national colonization schemes promote deforestation to accommodate the government's desire for foreign exxchange and peasants' need for land. In the last decade, over a million hectares of forest have been cleared for intensive agriculture, roads have been constructed in even the most isolated regions, and cotton and soybeans have become the new mainsprings of Paraguay's expanding export economy.

The environmental dangers of recent development in lowland South America have been stressed in a variety of studies (e.g. Sioli 1973, Goodland and Irwin 1975, Hecht and Cockburn 1989). In response to these concerns, governments and conservation groups, under aegis of UNESCO's Man and the Biosphere program (UNESCO-MAB) have begun to try to protect areas of existing oceans, savannas, and forests as biosphere reserves (Robertson Vernhes 1989). In these self-sustaining areas, development is restricted to protect the natural diversity of the original ecosystems for research and monitoring.

One purpose of the of the UNESCO-MAB biosphere reserve program is to "demonstrate sites of harmonious, longstanding relationships between man and the natural environment" (UNESCO 1987). Consequently, biosphere reserves are increasingly taking into account the indigenous groups that are decimated as a consequence of environmental destruction. Existing research, surveyed by Clay (1988), suggests that forest peoples manage the so-called "natural" diversity of the flora and fauna. Therefore, rather than treating them as artifacts in verdant museums, these efforts are integrating indigenes into the design and management of biosphere reserves.

To date, ecologists have principally focused on in-source management in biosphere reserves, as in the case of Panama's Kuna and the Embera Indians (Houssal and Weber 1989). However, recent research shows that indigenous groups have also developed advanced systems of sustained commercial production within the natural biological diversity of Latin America's forrests (Denevan and Padoch 1987). The following pages explore commercial *yerba* gathering by the Chiripá of eastern Paraguay with reference to the development of a biosphere reserve adjacent to their communities. Exxploing this case can build awareness of the existence of these sustained commercial systems and provide information for the development of a model for other areas.

This paper explores a proposal for and the evolution of one biosphere reserve. This case examines the Chiripá people, who are being integrated into the management of a biosphere reserve in the Mbaracayú region of eastern Paraguay (Fig. 1). This case is of special interest in that, in addition to using the forest for subsistence, the Chiripá of Mbaracayú have developed some of the commercial potential of the forest without degrading the region's resources. For centuries these indigenous people have protected wild seedlings of the undomesticated yerba mate tree (*Ilex paraguayensis*), whose foliage they harvested and sold. This minimal management technique increases the incidence of the plant, within the existing diversity of the forest environment. Ecologists and conservationists now hope to adapt these productive patterns to manage sustainable commercial activity within the Mbaracayú biosphere reserve.

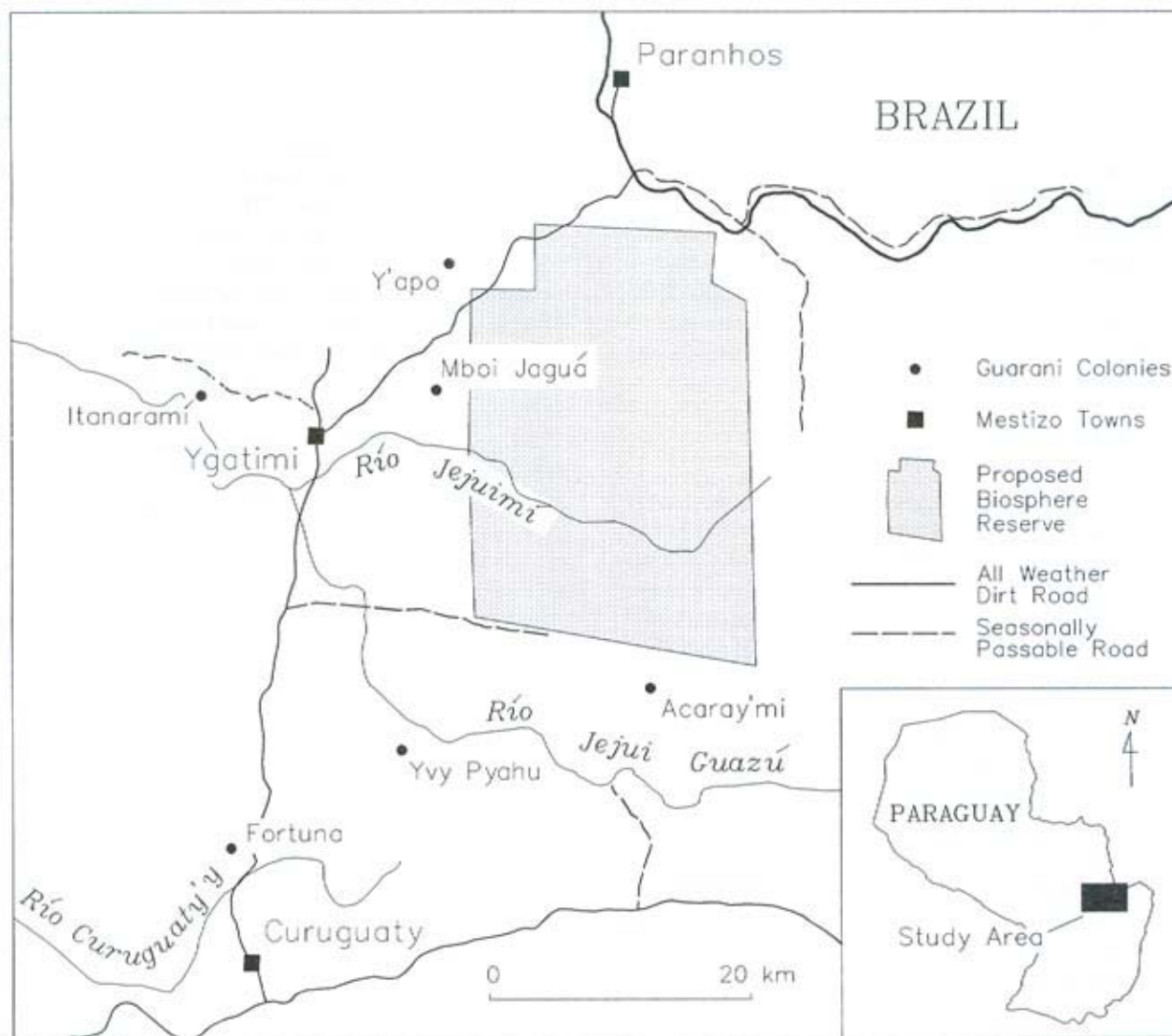


Fig. 1. The proposed Mbaracayú Biosphere Reserve and environs.

This study is based on two periods of research in the Mbaracayú regions, both funded by the Inter-American Foundation. The first research period explored commercial gathering and involved residence with the Chiripá from December 1981 to September 1983. In addition to traditional anthropological research, household labor, production, and consumption data were gathered from seventeen families over a period of a full year. The second study, focusing on the Mbaracayú proposal, involved a month's research with a biologist, a sociologist, and another anthropologist. Garden mapping and household surveys were used to identify changing production patterns. All research was carried out in Guaraní.

THE CHIRIPA AND THE YERBA MATE ECONOMY

The Chiripá population inhabit the low hills that comprise the Sierra de Mbaracayú. Most of their twenty-two villages are located in the headwaters of the Jejuí River. Although several communities are quite large, the majority contain less than a hundred households, scattered with their fields in small clearings and connected by narrow trails through the undergrowth. Most of these communities have been recognized by the Instituto Nacional del Indígena (INDI) and have been provided title to the land they occupy. The importance of the forest to these people is clear in their self-identification as "Ca'aguigua", literally meaning "people of the forest."

Chiripá communities exist within the matrix of the national society and economy. Historically, Chiripá and mestizo societies have been in close contact, as yerba attracted settlers to the two principal towns, Curugaty and Igatimí, in the 17th century. Recently, colonization schemes have caused a flood of immigrants, reducing the Chiripá to a small portion of the total regional population.

In addition to the Chiripá population, a community of non-Guaraní Ache live in Mbaracayú. As their economy is based primarily in subsistence hunting and gathering, their relation to the reserve will differ considerably from that of the Chiripá. Renshaw and Reed (1990) have conducted a survey of proposed Ache involvement in the reserve.

The forests of this region are high subtropical deciduous forests, classified as "Alto Paraná" (FMB 1990), or "Bosque Pluvial Brasileño" and "Bosque Humedo Templado Cálido" (CDC 1987). The region contains species that have largely disappeared from adjacent forested regions in neighboring Brazil. While 70 percent of the region remains forested, the area of 60,000 hectares that is of particular interest here, remains largely undisturbed.

Commercial use of these forests is not a new phenomenon. Since the Spanish conquest, the commercial collection of yerba mate has been the driving force in the regional cash economy. As early as 1590, boat loads of yerba were transported from this region for export to San Luis Potosí, Buenos Aires, and São Paulo (Susnik 1979). Yerba was Paraguay's principal export throughout most of the colonial era and post-colonial periods (White 1978). By the late 19th century, the market for the leaf had developed to the point that a multinational consortium of politically powerful investors, called "Industrial Paraguaya," had purchased land rights to much of eastern Paraguay (Reed 1987). This latifundio drew the most isolated areas of this vast forest into a commercial network that linked directly with national and international markets.

While commercial interests brought development into the farthest reaches of this region, it did not necessitate removing the forest cover. The leaves are collected by hand so as to not harm the yerba trees. They are then dried on wooden platforms and ground to a powder. Except for the narrow trails cut in the undergrowth and the small clearings where leaves are dried and bulked, the harvest leaves the environment undisturbed. It was a sustained extractive process that, after four centuries, had done little to alter the region's ecosystem.

Yerba production preserved the land base of the indigenous Chiripá and did not displace them from their forests. Historically, mestizos have had a tenuous presence in the region. As yerba collectors, they made only temporary forays into the forests and to bulking centers along major rivers. They had little effect on indigenous communities which were located in headwater regions. Moreover, the creation of a latifundio controlled by Industrial Paraguaya prevented non-Indian migration into the area. As the corporation policies generally ignored the indigenous groups, the Chiripá lived in what might be considered a de facto refuge with limited contact with the national society.

The mate leaf trade integrated the Chiripá into the commercial economy, allowing them to acquire cash and market goods. Chiripá workers formed kin-based work parties and contracted with mestizo *patrones* to purchase their yerba.² In return, the Chiripá acquired machetes, cookware, clothes and salt. The work was arduous and the compensation was clearly exploitative, but the Chiripá generally avoided debt-bondage. This extractive production was especially well suited to the labor resources of the Chiripá. The harvesting of yerba is labor intensive, not capital intensive, and the annual cycle of agricultural work, with greatest labor demands in August and September, integrated well with the yerba harvest of March to June.

Data gathered in surveys of household economies, which in 1983 had access to forest for commercial gathering, suggests that 60 percent of household income was derived from forest extractive industries, and 58 percent of that extractive income came from yerba collection. The remaining forest extractive income came from the sale of animal skins, 23 percent, and fence posts, 17 percent. Outside of extractive

industries, the principal source of income for the Chiripá was fieldwork, performed for mestizo patrons on the new ranches and farms of the region. The total cash income for the seventeen households over one eight-month study period was \$1,675 (273,036 Guaranís [Gs.] at an exchange rate of US\$1.00 = Gs. 163 in 1983), for an estimated average annual household income of \$147.

Rather than contributing to the demise of indigenous subsistence activities, the Chiripá integrated commercial yerba extraction into indigenous hunting and agricultural systems. Men moved between hunting, fishing, gardening, and yerba gathering, weaving the diverse activities into an annual cycle that guaranteed both subsistence and a cash income. Moreover, by exploiting a variety of resources, the indigenous groups were able to satisfy community needs without over-exploiting any one resource. Equally important, this dual system of subsistence production and commercial extraction allowed Chiripá communities sufficient autonomy to maintain a distinct social organization and ethnic identity, despite sustained commercial production in their forests.

PRESENT INTENSIVE DEVELOPMENT

Recent development in eastern Paraguay threatens the forests and the intricate relations that the Chiripá have established with their environment and the larger Paraguayan society. Roads were cut into this area in 1972, bringing new settlers and providing transport for new commercial activities (Fig. 1). After decades of political power, Industrial Paraguay's monopoly of land and commerce was broken under the long dictatorial rule of Alfredo Stroessner. Rather than initiate land reform in heavily settled areas, new programs encourage mestizo campesinos to migrate to this frontier area. The forests are being divided into twenty hectare plots by government decree and assigned to colonists, who were expected to grow cotton to purchase land titles.

Agro-industries are contributing to this process of destructive development. The Paraguayan economy has shifted from its dependence on yerba exports, to soybean, beef, and cotton production for international markets. Ranches and farms are cutting into the forests at an alarming rate. Satellite photographs show fields of tens of thousands of hectares being cleared for pasture. Between 1975 and 1980 alone, the total area under crops and pasture increased by 110 percent, destroying 876,000 hectares or 20 percent of the forests. The great proportion of land being used for large-scale agro-industry is evident in that the total rural population increased by only 16 percent during the same period (USAID 1984, 10).

This development is devastating animal and plant populations. The burgeoning population hunts the deer (*Mazama gouazoubira*) and peccary (*Tayassu pecari* and *Tayassu tajacu*) and destroys the habitat of the jaguar (*Panthera onca*) and other rare mammals. Plant life also suffers. The forest timber is sold off, even in areas not cleared for planting. Valuable hardwoods, such as *lapacho* (*Tecoma spp.*) and *tajy* (*Tabebuia spp.*), are harvested and the remaining timber is split for fence posts and firewood. As a result, the canopy is destroyed and the remaining species are further reduced by exposure to sun and rains.

The effects of recent development have been equally harsh on the Chiripá. With the demise of Industrial Paraguay, the indigenous communities had no legal recognition of their land and communities. Most of the indigenous peoples' lands were expropriated by the government and turned over to private entrepreneurs. Only after criticisms of anthropologists and the international community did the national government pass the Estatuto Indígena 904/81 to assure some land for indigenous groups. Even then, Chiripá families were offered plots of the same size as those offered to mestizo peasants. The policy assumed that the indigenous people would engage in intensive commercial agriculture like campesinos. The only concession to the indigenous lifestyle was to provide unalienable land title to communities, rather than individuals.

The government's policy of allotting indigenous communities twenty hectares for each nuclear family threatens the traditional commercial economy of the Chiripá. Twenty hectare parcels provide no forest expanses for subsistence hunting or commercial yerba gathering. The Chiripá have compensated for this loss of hunting and yerba production by planting cash crops. Recent surveys in three communities, show that the average garden size has increased by 40 percent as the Chiripá begin to plant cotton (Renshaw and Reed

1990). This increases land clearing and reduces forest resources, increasing their dependence on commercial agriculture. The Chiripá are forced into a destructive spiral, in which the short term solution to their problem exacerbates their already desperate situation. The end result could well be a life similar to that of the mestizo peasants, who are caught in an annual cycle of cotton production. Cotton production demands purchased inputs and destroys the soils, rendering the farmer ever more dependent on an exploitative world market.

Worse still, the present intensive commercial development by both Chiripá and peasants could prove to be unsustainable. Despite initial profits, evidence from the Amazon suggests that the fragile soil resources will not support these development strategies (Hecht and Cockburn 1989). Rain and the sun's rays quickly break down the thin topsoils. Farmers on similar lands in the nearby Brazilian state of Paraná have found that production declines rapidly after the first years, forcing them to flee to the northern states of Rondônia and Acre. Even soil scientists refuse to predict the long term ecological impact of intensive and continuous cultivation of these thin top soils.

These problems call attention to the importance of traditional indigenous resource management systems as alternative, sustainable, strategies for development in eastern Paraguay's forests. Rather than initiate a process of environmental destruction, the Chiripá practice of mixed agroforestry provides a sustainable food base and commercial profits without degrading the forests.

THE MBARACAYU RESERVE

The Chiripá of eastern Paraguay are in a unique situation to demonstrate the sustainability of their mixed economy, in the face of destructive development. The Nature Conservancy is attempting to preserve a portion of the remaining subtropical deciduous forest as a biosphere reserve, called Mbaracayú. With the help of anthropologists, the Chiripá are being recognized as a critical component of this ecological system. Their traditional production practices are being integrated into a regional plan to preserve the flora and fauna of the reserve, while providing them a sustainable source of commercial profits.

In 1970, part of the original Industrial Paraguaya latifundio was purchased by an international consortium funded by World Bank loans. The land was acquired for lumbering and speculative purposes, rather than the harvest of yerba. When the firm went bankrupt in 1974, the International Finance Corporation of the World Bank found itself holding title to 60,000 hectares of virgin forest. The subsequent weakening of Brazil and Paraguay's economies eliminated any hope of finding a purchaser interested in the entire parcel.

The Nature Conservancy, an environmental preservation agency, recently proposed that the land be protected by a joint Paraguayan-international effort. The 60,000 hectare parcel of unbroken forest would be designated a core area, under the UNESCO-MAB guidelines for a biosphere reserve, with a buffer zone that included the entire Jejuí River basin. Negotiations are underway to provide control of the core region to a Paraguayan conservation organization, Fundación Moisés Bertoni (FMB), which is interested in protecting the existing flora and fauna under the guidelines by the UNESCO- MAB biosphere reserve program. In 1989, when the FMB was requested to present a management program for the region, the author and another anthropologist were asked to analyze the feasibility of integrating indigenous residents into the plan. The result was a proposal to integrate Chiripá yerba collectors into reserve maintenance and development.

While the biosphere reserve remains at the planning stages, the analysis made clear that there is great potential for sustained yields of yerba from this land. It has historically been Paraguay's highest yerba producing forest, with nine distinct tracts of dense yerba growth. Over each three-year harvesting cycle, the Industrial Paraguaya harvested 250,000 kilos of yerba from these *yerbales*. At 1988 market rates of over a dollar for each kilo, this comprises an income of a over 80,000 dollars per year.

Four hundred Chiripá families are located near the proposed reserve. These families, as five communities, have legal title to small tracts suitable for agriculture, but insufficient for hunting or commercial gathering on their own land. It is suggested that they be provided rights to commercial gathering on Mbaracayú land as a supplement to the gardens they have on their own property. Rights to other uses of the biosphere reserve will

remain restricted. The regional population of Chiripá could drastically alter the forest if provided unrestricted agricultural rights on the land.

The income from 80,000 kilos of yerba, even if sold in its raw state at the farm-gate, would provide each family with \$200 each year. With costs of a federation of Guaraní yerba producers removed from that gross, each family would retain several times the present average household income of \$40. A portion of this profit would be used to offset the advances that most patrons give to workers who enter the forests. In addition, it has been proposed that some of the additional income be used to capitalize marketing, primarily in trucks for transport.

Gathering yerba from the reserve will provide cash to relieve the Chiripá families' needs to clear additional land for cotton production within their communities' forests, slowing the rate of forest clearing for agriculture and allowing fallows time for full recovery. Housal and Weber (1987) suggest that we must develop the capacity of indigenous people's organizations to manage their resources. In Mbaracayú, this could be accomplished using indigenous Chiripá institutions. In the past, work teams have been formed from the kin networks of the extant communities. These relations form a natural structure that can coordinate the administration of labor and the allocation of profits. In the future, it is hoped that these traditional social relations within and between communities can provide the structure for the marketing of yerba as well. At present, the five Chiripá communities have a loose affiliation, but with no formal structure that allows for effective political action or economic cooperation. The production of yerba would necessitate the formation of a regional federation of indigenous communities to administer the transportation and sale of yerba from Mbaracayú.

INDIGENOUS PEOPLES' RIGHTS

Recent efforts to integrate the Guaraní into the management of the Mbaracayú biosphere reserve raise critical issues concerning the rights of indigenous groups, the Paraguayan state, and foreign conservation agencies. All parties agree that indigenous groups have unique rights to use the forest. However, it is more difficult to find consensus on whether those rights preempt the right of conservation agencies to attempt to protect the forest from human influence.

In 1970, when the lands were purchased from Industrial Paraguaya, the new owners denied residence rights to the communities on the land; they were forced to relocate into the surrounding forests. Today, the indigenous groups, both Guaraní and Ache, are demanding recognition of their claims to this land. The Mbaracayú biosphere reserve establishes use restrictions on one of the last extensive forests of the Chiripá. They will not be able to reside on, or farm, the land. Moreover, they will not be able to harvest the timber and mineral resources or sell the land to create a capital base to enter the world markets on a firm financial footing. With respect to the greater humanitarian goals of the project, the Guaraní are dubious of both the intentions and the ability to protect the region from local campesinos and national *caudillos*. They would prefer two birds in the hand to one in the bush. However, with little power to confront an international environmental movement, the Chiripá have agreed to a compromise plan that would allow them to harvest yerba from the region, without degrading the present environment. It is important to note that the Ache, who also occupy the Mbaracayú region, have refused to compromise their rights to the forest. Having solicited recognition of ownership in 1981, they continue to demand that 6,000 hectares, if not the entire parcel, be titled to their communities.

CONCLUSION

Preserving the environment and promoting indigenous rights are not separate goals. Moreover, neither demands that commercial exploitation of forests be halted. All three objectives can be achieved through innovative planning (Vickers 1983; Smith 1982). Recently, attention has focused on agroforestry methods in which indigenes commercialize forest resources without degrading the tropical environment (e.g. Goodland and Irwin 1975; Bunker 1981; Treachy 1982; Schwartzman 1986; Denevan and Padoch 1987). Models of agroforestry vary from those in which the forest is cleared and replanted with commercial trees, to less managed models where valuable wild plants are simply nurtured in the context of a natural ecosystem.

Ramos (1980 and 1984) suggests that indigenous groups can best benefit from mixed agroforestry, in which natural forest resources are commercialized in a sustainable manner, while they practice swidden agriculture, hunt, and raise domestic animals for subsistence needs.

The Chiripá people have hunted, fished, and gathered in these forests for centuries. The commercial production of yerba has permitted them to maintain ethnic autonomy and a distinct social organization despite commercial contact with the larger society. Moreover, indigenous groups' access to the forest is critical to the preservation of the region's environment. Indigenous groups are an integral aspect of the ecosystem that conservationists seek to protect. More than simply exploiting the resources, Chiripá hunting and gathering are carefully organized to promote a complex balance between plants, animals, and soils. To restrict indigenous access to the area would destroy this critical balance.

Finally, the Mbaracayú reserve could provide an example for sustainable profits from other forested regions without degrading the forest environment. There is growing attention to the value of renewable resources extracted from Latin American rain forests (Peters, Gentry, and Mendelsohn 1989), particularly rubber harvesting in the Amazon (Schwartzman 1986). These studies emphasize the long-term profits to be gained and the dangers of dismantling these sustainable systems for short term profits. Systems of commercial yerba gathering have been devised by indigenous peoples and tested for over five centuries. Learning from this extensive history can help ensure the future of forested regions.

NOTES

1. This paper was first presented at the annual meetings of the Latin American Studies Association (LASA) in Miami, Florida, 6 December 1989.

2. Unlike relations between mestizo workers and their patrons, labor ties between patrons and Chiripa yerbateros were often reinforced through fictive kin relations.

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Resumen

Este artículo analiza la integración de los grupos indígenas Chiripá en la estrategia del manejo de los recursos naturales en una reserva biosférica en el oriente del Paraguay. Estudios recientes muestran que los

grupos indígenas ejercen influencia sobre la flora y fauna de los bosques tropicales de América del Sur. Activistas en la conservación de estos bosques ahora reconocen que la reubicación de estos grupos indígenas cambiaría los mismos bosques que de sean proteger. En Paraguay, por consiguiente, para lograr la protección de los últimos bosques subtropicales se debe tomar en cuenta modelos indígenas de producción y de manejo de recursos naturales. El caso de los Chiripá es importante en que, además de la producción de consumos, utilizan sistemas comerciales y sostenibles de extracción de recursos forestales.

Palabras claves: *reservas de biósfera, agro-silvicultura, Guaraní, Chiripá, Paraguay.*