

Cerro Cahuí

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The indiscriminate clearing of tropical rain forests poses a grave threat to sustainable development in Central America, leading to soil depletion, erosion, and the drying of streams and rivers. At risk are agricultural productivity and water supply, both essential for human survival. In the pace to build competitive industries and open trade barriers, these fundamental realities are sometimes forgotten. The Cerro Cahuí case, set in Guatemala's El Petén region, offers a stark reminder that one of the most difficult management challenges in Central America—and in all developing countries—is the management of natural resources. The causes of deforestation in Guatemala, as in other developing countries, are complex and interwoven into the political, economic, and cultural fabric of the society. The Cerro Cahuí case enables us to understand the complex interrelationships ranging from contraband timber, to cattle ranchers, to drug lords, to the Guatemalan army, to members of the National Congress. But it is not just the powerful who are responsible. Landless farmers, driven from other provinces of Guatemala during the 1980s by the army's counterinsurgency campaigns, use slash-and-burn agriculture as a means of basic survival. It is in this context that Carlos Oliva, project director of a local environmental foundation, Fundary, must develop a strategy for saving a protected area known as Cerro Cahuí, on the banks of Lake Petén Itzá near the internationally famed Mayan ruins of Tikal. He also is deeply concerned about raising the living standards of families in the three communities in buffer zones around Cerro Cahuí, whose extreme poverty presents a striking contrast to the affluence in the nearby Camino Real Hotel. This tension that Mr. Oliva feels between the goals of natural resource conservation and socioeconomic development is perhaps the major issue in Central American development today. The Sustainable Development Project proposed by the Guatemalan Tourist Bureau, with its emphasis on ecological tourism, appears to offer the opportunity to address these goals simultaneously. The foreign exchange earnings from ecologically conscious international visitors will create incentives to conserve the forest and wildlife resources rather than to exploit and deplete them, creating new jobs and bringing a new source of wealth to the impoverished buffer zone communities. A closer examination of the case reveals problems and threats in the implementation of the project, from the possible contamination of the lake to the potential influx of a new wave of immigrants.

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Carlos Oliva faces the same management challenge that confronts many other directors of nongovernmental organizations (NGOs) concerned with the preservation of tropical forests in Central America and other developing countries. It is a challenge of both design and implementation, in a highly convulsive—and dangerous—sociopolitical environment and with severe resource constraints. Most of these directors are biologists or zoologists with little or no management training to prepare them for the challenge. Cases such as this one, prepared by INCAE's Program in Natural Resource Management, provides a useful basis for discussion and learning not only to NGO directors but also to public- and private-sector managers who play a role in the evolving drama in places such as El Petén. © 1997 Elsevier Science Inc. J BUSN RES 1997. 38.47-56

The view from the Boeing 737 carrying North American and European tourists from Guatemala City to the northern province of El Petén revealed a remarkable contrast between the cloud forests that covered the mountain tops and the completely deforested hillsides and valleys. As the plane flew northward, Carlos Oliva, project director of the Mario Dary Foundation (Fundary) was struck by the lushness of the tropical forests that remained untouched. Observing the strong military presence at the El Petén airport, the grazing lands along the road to Tikal National Park, the luxury tourist coaches departing the Camino Real Hotel for Tikal, the majestic landscape of Lake Petén Itzá, and Cerro Cahuí mountain at sunset, and the distended bellies of undernourished children in surrounding villages, Mr. Oliva reflected on the problems and opportunities in the region.

Upon his return to Guatemala the last week of August 1994, Mr. Oliva would have to present Fundary's position on a sustainable development project proposed for the Cerro Cahuí biotope (protected area) in El Petén and for the neighboring communities of El Remate, Jobompiche, and El Caoba at a meeting that would also be attended by representatives from a university research center (CECON) and the Guatemalan Tourism Bureau (INGUAT). Both were counting on Fund-

Table 1. The Tourism Industry in the Guatemalan Economy

Item	1989	1990	1991	1992	1993
Tourist influx (by place of origin)	437,019.0	508,514.0	512,620.0	541,025.0	561,917.0
United States and Canada	114,521.0	124,066.0	130,335.0	151,531.0	160,120.0
Europe	72,629.0	83,166.0	91,911.0	103,837.0	114,077.0
Central America	178,281.0	234,173.0	221,467.0	204,284.0	194,477.0
Other countries	71,568.0	67,109.0	68,907.0	81,373.0	93,243.0
Average stay (days)	6.3	6.1	6.7	6.8	6.8
Hotel rooms	8,016.0	8,509.0	8,962.0	9,425.0	10,266.0
Average hotel occupancy (%)	80.3	84.1	83.5	83.7	78.4
Foreign exchange income from tourism (U.S.\$ millions)	151.9	185.2	211.3	243.2	265.4
Average expenses per tourist (\$)	347.6	364.2	413.4	449.5	472.3
Daily average expenses (\$)	55.2	59.7	61.7	66.1	69.5
Macroeconomic indicators					
GDP (U.S.\$ millions)		7,630.0	7,874.0	8,236.0	8,566.0
Inflation rate			10.0	14.2	13.0
Exports (FOB, U.S.\$ millions)			1,230.0	1,287.0	1,325.0
Imports (FOB, U.S.\$ millions)			1,673.0	2,262.0	2,500.0

El Petén Province

The province of El Petén covers an area of 3.6 million ha, 1.6 million of which make up the Maya Biosphere Reserve (Figure 1). In spite of its economic importance as a major source of petroleum and precious woods, El Petén is politically and economically isolated from the rest of the country, and the majority of villages in El Petén lack the most basic services and infrastructure. According to Julio Torres, a professor at San Carlos University who has done extensive research on the socioeconomic dynamics of the region,

The Guatemalan government is not capable of enforcing the law in El Petén. Here, power is shared by the army, the drug dealers, the lumber companies, and cattle ranchers. Money and force are used to impose rules. The safety of citizens cannot be guaranteed. The only places that are free of these problems are those frequented by large numbers of tourists, such as Tikal. The lack of safety for tourists affects the government's image abroad.

Over 75% of El Petén's inhabitants had emigrated from other provinces, fleeing from guerrilla violence and seeking

better economic opportunities. Heavy migration continued in 1993, and the population grew by some 60% over its 1981 figure of 132,000 inhabitants, as revealed by the last census. Sixty percent were illiterate, and 80% lived in extreme poverty. Only 12% of the dwellings in the province had electricity and running water.

Between 1978 and 1985, El Petén was the focus of intense guerrilla activity. Petroleum facilities were sabotaged, bridges and government buildings were destroyed, and rural villages were temporarily seized. This provoked a strong response from the army, which established several military bases and carried out repressive campaigns in the area. In 1993 there were still two military bases, a training school for *kaibiles* (specialized combat forces), and over 5,000 troops in the province. According to Julio Torres,

The army is the only state institution capable of exercising authority in the region, because it has abundant resources including combat aircraft and helicopters. Now that the guerrillas are defeated, the military hopes to justify its presence by the need to control drug trafficking and provide the population with infrastructure.

The anti-guerrilla war was accompanied by forced conscription and a harsh crackdown on the population that targeted cooperatives and other community organizations and resulted in the death or disappearance of thousands and the relocation of more than 300,000 refugees in the southern states of Mexico. By 1994 these campaigns had ended and the government was engaged in peace negotiations with the guerrillas, but the military continued to exert control over the civilian population. According to one army officer,

We won the war and prevented the communists from taking power in Guatemala; otherwise, it would have been

Table 2. Tourism in Tikal National Park

Year	Foreigners	Natives
1986	27,206	8,906
1987	56,174	12,688
1988	54,202	11,331
1989	61,450	15,090
1990	74,667	14,477
1991	78,843	15,607
1992	94,320	16,596

ary's active participation in the project. Mr. Oliva felt strongly committed to achieving sustainable development in the region, but he had growing concerns about whether Fundary should participate, and if so, in what capacity. He intended to discuss these concerns with the chairman of the Board, who was also acting chief executive since the resignation of Fundary's executive director 3 months earlier.

The Guatemalan Political Environment

Fundary operated in a convulsive political environment. A crisis had erupted in the previous year when on May 25, 1993, Jorge Serrano Elias, president of Guatemala since 1991, suspended the Constitution and dissolved Congress and the Supreme Court after tense weeks of political conflict with opposition parties. Serrano alleged that "Guatemala's democratic system is being threatened by corruption and drug dealing. . . . This problem is particularly serious among congressmen and Supreme Court justices." However, the press charged that Serrano's administration was as corrupt or more so than other branches of government. On the days prior to the events of May 25, the Supreme Court had opened a case against the president, and some of his aides were being accused of unlawful enrichment.

President Serrano's attempts to win support for these emergency measures were unsuccessful. Political parties, civic organizations, the business sector, and the international community were unanimous in their condemnation of the measures, causing the military to withdraw its initial support of the president's action. Without military support, Serrano's position became indefensible, and he was forced from office. On June 6, Ramiro de León was elected president of Guatemala, putting an end to 10 days of political uncertainty and confusion. De León had established public credibility in his former position as Human Rights Ombudsman, always maintaining a critical attitude toward the government and the army. This caused concern among some political analysts, who believed that Ramiro de León's new role as commander of the army would prove difficult. According to one political analyst and expert in military issues,

the army's decision not to back Jorge Serrano's dictatorial actions is an indication of the power that reformist military members who support democracy are gaining. . . . Ramiro de León's election offers the best opportunity in recent years to begin the political and social reforms that this country needs, but he must act promptly to build public support since he lacks the support of traditional political parties that dominate Congress.

If he does not avail himself of the support of other sectors of society, the government's agenda will be dictated by Congress, which is plagued with corruption and has no interest in implementing any kind of sociopolitical reforms.

The Economic Outlook

The Serrano government had been successful in its efforts to stabilize the economy in the 2 years prior to the election of de León. Annual inflation in May 1993 was 12.5% compared to 14.2% a year earlier. However, the uncertainty caused by the political crisis was creating economic instability. During the weeks following Serrano's ouster, sharp price increases had intensified inflationary pressures. On the black market, the exchange rate rose from 5.50 quetzals (Q) per U.S.\$1 to Q5.90 per \$1 in the last week of May. In order to avoid further devaluation of the quetzal, the Central Bank had to draw down international reserves. In less than 3 weeks, net reserves decreased by \$31 million, to \$479 million.

The political crisis also produced a disinvestment of Q300 million in government certificates. As a result, liquidity increased significantly in less than 2 weeks and the Central Bank was forced to raise interest rates by more than three points.

The longer-term impact of the political crisis on Guatemala's economy was not yet clear. Several analysts agreed that there would be an increase in the GDP of about 3%. However, forecasts regarding inflation, the exchange rate, and the fiscal deficit varied significantly. In spite of the foreign exchange generated by tourism and nontraditional exports, the trade deficit for 1993 was estimated at more than \$1 billion, or 9% of GDP. Carlos Oliva believed that the impact of political uncertainty and economic instability was greatest on the poor, and in Guatemala, according to United Nations Development Programme's (UNDP) human development indicators for 1989, 71% of the population lived in abject poverty.

The Tourism Industry

Tourism is a major source of foreign exchange for Guatemala (Table 1). Beginning in the 1950s, tens of thousands of tourists were attracted to Guatemala's Mayan ruins and the beauty of its lakes, volcanoes, and beaches. Tourist activity decreased significantly in the late 1960s with the rise of revolutionary guerrilla movements and the spread of civil conflict. By the 1990s, however, the situation had begun to improve. "We are seeing a tourist boom again," said one INGUAT official. "The number of tourists in 1992 was almost triple that of 1984. This is due to greater stability and safety brought about by the new democratic government. Conditions will continue to improve once peace negotiations with the guerrillas are concluded later this year."

Among the most popular tourist attractions was Tikal National Park, where the largest Mayan city was built between 100 and 900 A.D. In its heyday, Tikal occupied an area of 120 k², and its population was over 50,000. The park covered a tropical forest area of 55,000 ha (acres) and contained a large variety of wildlife amid the temples and pyramids. Perhaps because of its popularity, Tikal was the only national park in Guatemala that charged an entrance fee of U.S.\$3.00 per visitor. Statistics on visitors to Tikal are presented in Table 2.

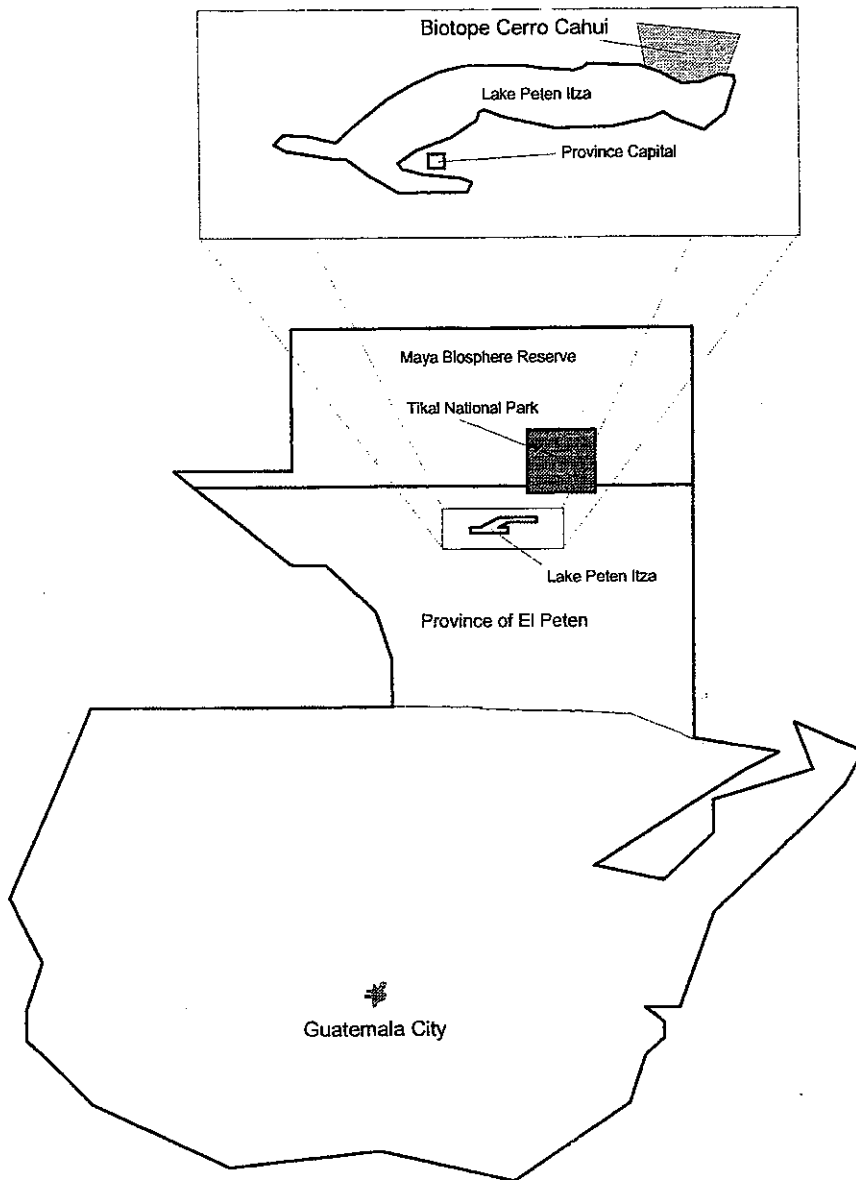


Figure 1. Map of Guatemala.

the same as in Nicaragua. We did whatever was necessary. We know some things were not pleasant, but it was not a game. Thousands of soldiers died gloriously defending our beloved homeland. We must be ever vigilant against a guerrilla resurgence.

The army actively cooperated with the U.S. Drug Enforcement Agency (DEA). However, it was generally believed that some high-ranking army officials were linked to the international drug cartels operating in the area. Tom Sheldon, a DEA officer working in Guatemala, said:

We do not have exact data, but we know that marihuana and poppy plantations occupy several thousand hectares in El Petén and that there are at least five clandestine landing fields from which thousands of kilos of cocaine,

marihuana, and opium are transported to the United States. Considering the army's total strength and its military equipment, these activities could not be carried out without the cooperation of some of its top-level members. However, we (the DEA) can do very little against internal corruption in the army. They have the power in this country.

The corruption caused by drug producers and traffickers also affected some civilian government officers. As a mid-level official of the Ministry of the Interior put it, "drug traffickers have so much money that they can bribe all the ministry employees. When they are unsuccessful, they resort to threats, kidnappings, and murder."

Cattle ranching, lumbering, subsistence agriculture, and deforestation were closely related phenomena in El Petén. For

more than 50 years, the typical sequence entailed selective lumbering, total deforestation for subsistence agriculture purposes, and land use for livestock breeding. The Integrated Development Plan of El Petén (Vol. 1, Agrar-Und Hydrotechnik, GMBH, 1992) noted that between 1976 and 1987, these activities caused deforestation at the rate of 30,000 hectares per year. The power of large cattle ranching and lumber interests of El Petén had co-opted the top echelons of government. Special interests persuaded successive governments to adopt the policy of selling large tracts of forest land at concessionary prices, which led to an increase in the number of cattle in the region from 7500 head in 1979 to more than 30,000 by the beginning of the 1990s.

Lumbering activity in El Petén had declined since the end of the 1980s with the creation of the Maya Biosphere Reserve and the pressure exerted by international conservationist groups. In 1989, sawlog production was 70% lower than the 1979 level. The decline of the legally established lumbering industry had caused an increase in wood smuggling to Mexico and Belize. Juan Alvarez, a member of The Nature Conservancy, believed that

Illegal lumbering occurs mainly on lands in the Maya Biosphere Reserve. This is possible because it is a protected area created only by decree. In practice, the government has not been able to enforce protection laws effectively. The large size of the Reserve also makes it difficult to monitor. It is larger than all of Costa Rica's national parks combined. Moreover, smugglers have established corruption networks involving high-ranking government officials, army officers, and lumberers of El Petén.

Subsistence agriculture is another cause of deforestation in El Petén. Small farmers cut down and burn forest lands that they then abandon after two crop years and do not reuse for 6 to 8 years. Pedro Jolón, a farmer from Alta Verapaz province and father of 10 children, commented,

El Petén's forest is endless. Last year, I walked northward for two months and saw nothing but huge green trees. Now the government, the military, and the "gringos" do not want us to cut down the trees. If I don't grow corn and beans, my children will starve. God provides for all and we only want some land to survive.

The Conservation Research Center (CECON)

CECON was established in 1981 as a department of the University of San Carlos (USAC) to conduct research on information, protection, and management of Guatemala's natural resources. At the end of 1981 it was charged with managing a protected area known as the "Quetzal Biotope," which resulted in a considerable increase of its budget along with an expanded mandate. By 1993 CECON was responsible for managing

seven biotopes located throughout Guatemala. It had several basic and applied research programs in the areas of conservation, rural ecological development, and classification of flora and fauna. It also offered environmental education programs to school children, university students, scientists, and rangers. In addition, CECON operated a seed bank, through which it exchanged seeds with more than 500 botanical gardens around the world. It was also responsible for managing the Conservation Data Center (CDC), which maintained a computerized inventory of the characteristics and distribution of Guatemala's biological and ecological diversity.

CECON's annual operating budget was approximately U.S. \$250,000, with 30% earmarked for administration and 70% for biotope management expenses. Research projects and equipment or infrastructure investment depended almost entirely on endowments from international conservation institutions (the World Wildlife Fund, The Nature Conservancy, and Conservation International, among others). Project donations varied from year to year, but they always exceeded the regular operating budget. Since its founding, none of CECON's activities had generated any kind of income because of USAC's policy not to charge for community outreach services.

The Mario Dary Foundation

The Mario Dary Foundation (Fundary), whose name honors the founder of CECON and USAC's School of Biology, was created in 1989 as a channel for project grants to CECON from international organizations. These grants had previously been managed by USAC's finance department, which had sometimes delayed project disbursements for months and even years.

Fundary's initial objectives were to contribute to environmental development and conservation and foster scientific research in related fields. It was governed by a board of directors, which included the executive director of CECON as its only permanent member. The other members were elected for 4-year periods by the membership, which included the founders and collaborators.

Fundary had a staff of four professionals in addition to the executive director position that was currently vacant. Carlos Oliva, the project director, and a project assistant were responsible for project design and implementation. A technical assistant was responsible for gathering and evaluating technical and scientific data, and an administrative assistant took care of the accounting and personnel functions.

In addition to administering grants to CECON from international donors, Fundary had begun to develop some independent project initiatives, for which it received 10% of the total project cost to cover overhead expenses. Tables 3 and 4 contain the most recent Fundary income statement and balance sheet. In 1994 these initiatives included:

1. The Punta de Manabique Integral Development Project, carried out with the cooperation of the Ecological Devel-

Table 3. Income Statement, Calendar year 1993 (in quetzals)

Revenues	
Overhead	169,281.49
Trust	50,000.00
WWF endowments	10,687.80
Other revenues	199.31
Total revenues	230,168.60
Expenses	
Salaries and benefits	98,891.99
Operating expenses	32,133.62
Maintenance, installation, repair, mobilization, and equipment	470.80
Contract legalization fees	406.60
Insurance expenses	62.60
Contingencies	11,980.26
Fixed assets acquisition	338.99
Total expenses	144,284.86
Balance	85,883.74

opment Fund. The project's long-term objective was to transform local communities into guardians of their own natural resources (Total project cost, Q100,000 per year).

2. The Pextebatun Archaeological Project, implemented in conjunction with Vanderbilt University, USAC, the National Institute of Anthropology and History, and the Swedish International Development Authority. The objective of this project was to conduct scientific research on the ecological adaptation of the Mayas in the southern region of El Petén (total project cost, U.S.\$80,000 per year).
3. A scholarship fund sponsored by The Peregrine Fund. The objective of this program was to provide financial

Table 4. Fundary: Financial Statement, December 31, 1993 (in quetzals)

Assets			
Current assets			
Cash and deposits	747.28		
Accounts receivable	102,934.01	103,681.38	
Fixed assets			
Land, plant, and equipment	91,259.61		
Total assets	194,940.99		
Liabilities			
Reserves for work presentations	16,459.35		
Capital			
Fundary capital	91,259.61		
Accruals from previous periods	1,338.29		
Balance	85,883.74	87,222.03	178,481.64
Total assets and liabilities	194,940.99		

aid to outstanding university students in biology (total annual cost of the scholarship program, Q12,000).

4. Conservation of Guatemala Trust, established in conjunction with the World Wildlife Fund, the Nature Defense Foundation, and the Inter-American Tropical Research Foundation. The Trust's main objective was to manage and develop foreign debt-for-nature swaps in Guatemala.
5. The Sustainable Forest Conservation Project, carried out with the cooperation of Conservation International. The aim of the project was to promote sustainable forest resource utilization and to foster microenterprises and ecological tourism in El Petén (total project cost, Q800,000 per year).
6. The Maya Project, implemented with the collaboration of The Peregrine Fund. This was a research project on predators in El Petén's tropical forest (total project cost, Q40,000 per year).

Yvonne Ramirez, the foundation's technical assistant, believed that Fundary could be considered a successful NGO in the procurement of financial support for the strengthening of institutions committed to environmental and natural resource conservation:

We offer security and efficiency in the administration of projects funded by international donors. We also provide technical cooperation to the organizations with which we work. That is why we have excellent relations with international agencies and national government institutions.

"Fundary is an administratively and financially responsible institution," expressed one member of The Nature Conservancy in Central America, "which made it an ideal vehicle for jump-starting conservation and sustainable development projects." However, Fundary's very success had created some friction with other local institutions. "Some of CECON's people are jealous of our work," reported one staffer. "They either hinder our projects subtly or refuse to cooperate."

For Carlos Oliva, working at Fundary was a challenge. "I am committed to rural development, and I believe that social and environmental sustainability should not be dependent upon economic growth. At Fundary, I have the opportunity to design and work directly on projects that seek sustainable development for the neediest." Carlos Oliva was 28 and had studied anthropology at the Autonomous University of Mexico with a specialization in environmental sciences. He had begun working at Fundary as a technical assistant in June 1992.

The Cerro Cahuí Biotope

The protected area of Cerro Cahuí (or "Cahuí Hill") was established by CECON in October 1981 and officially declared a protected area in 1989. It covers 651 ha and is located south of Tikal National Park, on the northern banks of Lake Petén

Itzá (Figure 1). This is a subtropical rain forest area with an average annual temperature of 23.3°C, ranging from 16 to 35°C (60 to 95°F) and an annual average rainfall of approximately 1,416 mm, most of which falls during the rainy season from May to September. It has a slightly sloped rocky calcareous soil, which is unsuited for agriculture. The Cerro is the main geographical feature of the protected area, rising to an elevation of 360 meters. The tropical forest of Cerro Cahuí was rich with the flora and fauna typical of El Petén's central region. Compared to other protected areas of El Petén, Cerro Cahuí stood out for having more than 120 bird species and over 50 exotic butterfly species. Occasional remains of Mayan burial grounds, long since looted, could be found along a tourist trail.

The Cerro Cahuí biotope had been established with six objectives: (1) to protect and preserve a natural area of great scenic, cultural, and scientific value, representative of subtropical rain forest wildlife; (2) to contribute to the protection of El Petén's animal wildlife and their habitat; (3) to provide sources of environmental education and interpretation as well as information on the natural and cultural resources of the Cerro Cahuí area; (4) to provide recreation and tourist resources and prevent the deterioration of its cultural and scenic value; (5) to contribute to the socioeconomic development of the communities in the biotope's service area; and (6) to provide a wildlife area in which to promote scientific research in order to identify the natural and cultural resources of the region.

CECON had drawn up a master management plan for the area and had conducted an inventory of the flora and fauna. It had built a rudimentary tourist information center, restrooms, dressing rooms and showers, two trails, a boat dock, and administrative facilities. Except for the administrative facilities and the boat dock, the rest of the biotope infrastructure had not been used frequently and had received little maintenance.

There were two park rangers and six workers responsible for watching and protecting the area and maintaining the infrastructure. They also controlled free admission (see data on volume of visitors in this and other protected areas, Figure 2). They were equipped with a small motor boat, machetes, axes, and gas lamps. They also had two four-wheel drive vehicles for driving to other biotopes where they also worked part-time, although one of the vehicles had been out of order for more than a year. According to José Tucux, one of the biotope workers:

As for the boat and the vehicles, it is as though we didn't have them, because we almost never have gas. We have no time or resources to maintain the tourist infrastructure. For example, the new showers and dressing rooms built by INGUAT only mean more work for us. We have to choose between watching the place or cleaning and maintaining the facilities. That's why they've been closed since they opened last year. We don't know how many tourists we should allow into the biotope. There are months when

no one comes, but some other times we get up to 100 people in one day. They just told us not to let "too many" in. We were not hired to help tourists—although we do it with pleasure—but we get no pay for it.

The park rangers and the workers lived in the communities surrounding the biotope. They all had primary school education, and only two of them had finished high school. Also, they had taken basic courses on management and control of protected areas. The rangers' average monthly salary was U.S. \$175, and the workers' was U.S. \$100. They were supervised once a month by a forest management technician. Ninety percent of the biotope's annual budget was spent on the rangers' and workers' salaries, and 10% was earmarked for administrative expenses.

Communities Adjacent To The Biotope

In the biotope's buffer zone, there were three communities, El Remate, El Caoba, and Jobompiche, which together had a total population of approximately 3,000 (see statistics on these communities in Table 5). The road to Tikal National Park cut directly through El Remate and El Caoba to the east of the biotope. Jobompiche was west of the biotope, 2.5 km from El Remate, and could be reached by an all-weather, unpaved road that bordered the bank of Lake Petén Itzá and also served the Camino Real Hotel (Figure 3).

In Jobompiche there was a community water system, and in El Remate public telephones had been installed in 1992. None of the settlements had sewage systems, electricity, or drinking water. At El Remate, there was a health center with a medical assistant. However, the center had no medical equipment or supplies to provide basic health services to the population. There were elementary schools in El Remate and Jobompiche, each with one teacher. Attendance of school-age children in those communities was less than 25%, and desertion after second grade was almost total. María Vega, a mother of eight children, commented, "at school children do not learn anything that helps them to eat; they learn to read and write . . . but here nobody needs to read or write to be able to work the land."

About 97% of the adults living in the three communities were born in other provinces of the country. Emigration had been occurring for 50 years, as settlers came in search of land and encouraged their relatives to join them. Most people from El Remate and El Caoba came from the southeastern region of the country and were *mestizo* (of mixed Spanish and Indian origin). In contrast, most of Jobompiche's inhabitants were K'eqchi Mayas from the neighboring province of Alta Verapaz who spoke their own language. They had very little contact with the nonindigenous inhabitants of Jobompiche.

The formal structure of these communities had disintegrated during the military campaigns of the 1980s, so that by

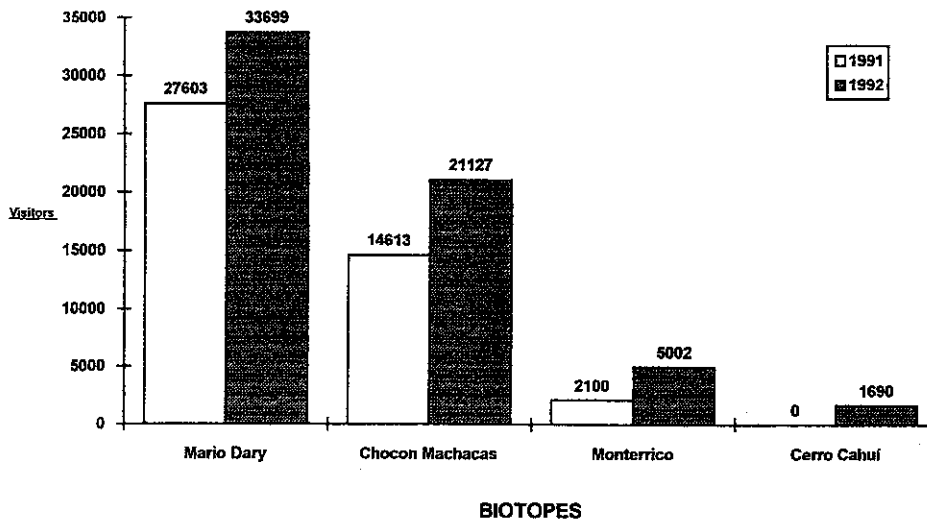


Figure 2. Number of visitors to protected areas (biotopes), Guatemala.

1994 none had elected authorities. The only formal economic organization in existence was a group of wood craftsmen who sold their products to tourists visiting Tikal. However, according to one field worker, "the small association they are organizing is very unstable and they don't take it seriously most of the time. Everybody wants benefits from it, but nobody does anything to make it work."

According to observers, authority and cooperation among the inhabitants in these three communities are strongly determined by family ties. Over the years, extensive family groups have been formed whose authority depended on longevity in El Petén. Among the K'eqchis in Jobompiche, informal community organization revolve around religion, with the K'eqchi healer and the village elders having the greatest authority. K'eqchi religious beliefs and traditions center around maize cropping. Carlos Oliva explained that the K'eqchis had a set of deeply rooted agricultural traditions with maize at the

core of social and religious life. "Their religious practices," he said, "come directly from their Mayan ancestors, even though they were heavily influenced by catholicism."

The most important economic activity of the three communities is maize farming. Fishing and extraction of natural resources, such as gum, ornamental plants, and wild animals from El Petén's tropical forests, are marginal activities that contribute little to family income. The sharp increase in Tikal's tourist activity in recent years has given rise to handicraft production and generated some employment in construction or services in tourist hotels. In El Remate there were three small "ecological" hotels and one under construction, and the most luxurious hotel in El Petén, the Camino Real Tikal, was located near Jobompiche. Other sources of income included temporary jobs with archaeological, agricultural, and environmental conservation research projects. In El Remate, there was an agricultural experimental station directed by the Chinese Agency for Development that had provided 15 people with temporary employment. According to one development worker,

Table 5. Relevant Statistical Data on Communities Surrounding the Biotope

	El Remate	Jobompiche	El Caoba
Main Economic Activity			
(% population)			
Agriculture	70.6	93.3	78.6
Natural resource extraction	0.0	0.0	0.0
Park rangers	5.9	0.0	14.3
People employed in hotels and other tourist sites	11.8	0.0	7.1
Apiculture	0.0	6.6	0.0
Other	11.7	0.0	0.0
Other information			
Population (000's)	416	399	373
Male	214	203	197
Female	202	196	176
Number literate	153	140	123
Economic active population	103	100	89
Indigenous people	6	15	103

Everybody gets a job at El Petén. We should not forget, however, that most people live in extreme poverty, though they have enough income to survive. People in the surrounding communities are unable to take advantage of job opportunities resulting from the tourist boom because they cannot read and write. Most of the people who work at the tourist hotels close to the biotope come from El Petén's capital.

The Sustainable Development Project

The University of San Carlos and INGUAT had signed an agreement as early as 1979 to work jointly on the promotion of cultural and natural resources. In accordance with this

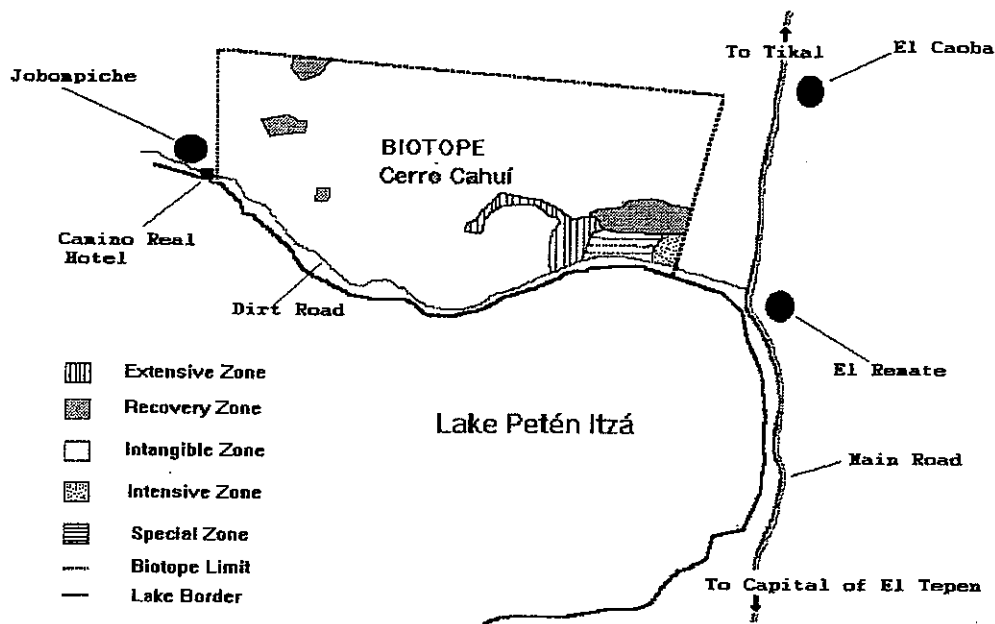


FIGURE 3. Zones and limits of the Cerro Cahuí biotope.

agreement, INGUAT made funds available to the University to recruit field personnel and purchase materials for the administration of the biotopes. However, according to Carlos Oliva,

CECON has not taken fullest advantage of the cooperation opportunities offered by INGUAT. Innovative projects that go beyond traditional administrative support must be proposed. For this reason, the design and development of the Cerro Cahuí Sustainable Development Project is a challenge for us. If we are successful, possibilities for cooperation among Fundary, INGUAT, and CECON will be promising in the future. If results are not satisfactory, INGUAT will turn to other organizations.

The Cerro Cahuí Sustainable Development Project, which was still in the feasibility study stage, had three principal objectives: (1) to foster economic sustainable activities in the communities adjacent to the biotope; (2) to encourage people from these communities to become involved in the conservation tasks necessary for the protection and development of the area; and (3) to promote research that would provide deeper knowledge of the area's natural resources. This research also would provide information that would serve as the basis for the development of updated management plans.

It was estimated that project implementation would require at least 3 years and that annual expenses would not be lower than U.S.\$25,000. A detailed budget for the first year of the project had been drawn up for Carlos. Estimates were based on the budget for the first year of the project (see data in Table 6). Probably a greater investment would be required during the second and third years. From conversations with INGUAT representatives, Carlos Oliva knew that it was possi-

ble to obtain a grant for U.S.\$50,000 for the first 2 years. Any additional amount would depend on future negotiations and the success of the first 2 years.

A number of CECON botanists and zoologists believed that before making any decision about a possible development project in Cerro Cahuí, the following aspects should be considered:

Table 6. First-Year Project Budget (in quetzals)

1. Infrastructure	66,779.86
1.1. Information center upgrade	39,149.72
1.2. Interpretative trails	22,693.65
1.3. Upgrade of camping facilities	0.00
1.4. Shop and refreshment bar	0.00
1.5. First-aid post	2,727.17
1.6. Service charges	0.00
1.7. Contingency fund	2,209.63
2. Interpretation	12,320.32
2.1. Area's natural resources	9,024.54
2.2. Introduction to El Petén	1,538.60
2.3. Contingency fund	1,757.49
3. Dissemination of information	29,705.55
3.1. Informational panels	5,877.80
3.2. Brochures	20,984.27
3.3. Other expenses	1,846.70
3.4. Contingency fund	997.78
4. Training	4,745.79
4.1. Field personnel	326.24
4.2. Hospitality personnel	0.00
4.3. Community	3,993.69
4.4. Contingency fund	425.86
5. Bird watching	8,676.04
5.1. Research	8,676.04
6. Administration	12,222.89
Grand total	134,451.76

1. The negative impact of the increase in the number of hotels located in the biotope's buffer zone. Big development investments in and out of the biotope's limits will attract greater investment in hotel construction. The problem with hotels is that there is no state agency to supervise and regulate the negative environmental impact of these projects. Building a new hotel normally means cutting down that part of the forest that still remains in the buffer zone. Also, solid waste and sewage waters from hotels end up in the lake sooner or later.
2. With the new hotels and the increasing numbers of tourists, economic activity will increase and so will the number of settlers in these communities. New settlers means further deforestation, more garbage, in short, greater pressure on the fragile ecosystem of Cerro Cahuí. Priority must be given to the development of security,

monitoring, and research programs before promoting it for tourist purposes.

Once he was back in Guatemala City, Carlos Oliva was getting ready to draft the sustainable development project proposal for the biotope and its adjacent communities. For him, it was a challenge to design a project that would have real success and long-term possibilities once economic and technical assistance ended. He also wondered whether it was too risky for the Foundation to get involved in such a project. Besides coordinating with INGUAT and CECON, he needed the approval of Fundary's Board of Directors. Working at his computer, Carlos Oliva finally wondered whether this project was attempting to solve, in 3 years, all the problems of poverty and impoverishment that Guatemalan society had not been able to eradicate in 500 years.