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Michael Miller

INTRODUCTION

Costa Rica is known globally for its impressive record of establishing national parks and other types of protected spaces. Largely since the 1970s, that country has developed an impressive system of protected areas, which now covers approximately 28% of the national territory. These areas are diverse in nature, ranging from national parks, biological reserves, national monuments, natural reserves, wildlife refuges, and indigenous reserves that are more strictly protected, to forest reserves and protected zones that are managed to allow greater economic-driven activities, such as wood extraction (Evans, 1999, pp. 7-9). The first major step taken by the Costa Rican government in developing this system was its passage of the Forest Law of 1969, which called for the establishment of protected areas (Asamblea Legislativa, 1969).

In many other instances, however, Costa Rica has had significant difficulties in carrying out its progressive environmental statutes and regulations. In fact, environmental movement leader Alvaro Ugalde described his country as a leader in three things: conservation,

deforestation (understood as the clearing of forests), and pollution of river systems (A. Ugalde, personal interview, April 19, 2002). Indeed, while a new and improved Forest Law of 1996 intends to better protect forests outside of protected areas, major forest loss is still occurring in several areas of the country.

This chapter examines the causes of the disappearance of a substantial amount of forest in Costa Rica's Área de Conservación La Amistad-Caribe (ACLAC) (Amistad-Caribe Conservation Area). The ACLAC is one region within a system of "conservation areas" into which the entire territory has been divided, encompassing roughly the southeastern corner of Costa Rica, running north more than halfway up the Caribbean coast and south to the border with Panama, and extending inland to the Talamanca Cordillera. (See Maps 9.1 and 9.2.)



Map 9.1 Location of the ACLAC within Costa Rica's National System of Conservation Areas

Source: Sistema Nacional de Áreas de Conservación (SINAC) (2002)



Map 9.2 Map of Costa Rica with Political Boundaries and Topography
 Source: Perry-Castañeda Library Map Collection, University of Texas (2005)

Costa Rica is widely regarded as providing a “model” for the developing world on how to design and execute a system of protected areas. This chapter helps to explain why that country has not been able to provide a better example of how to control forest loss outside of such protected spaces. Answering this question points toward what policies might best address this problem, setting the

country on a course to once again provide a model for other developing countries. As I will explain, however, determining and carrying out these policy reforms will be difficult, as the disappearance of forest in the ACLAC originates in well-embedded conditions: legal loopholes, poverty, insecure land tenure, corruption, budgetary deficiencies, and ineffective judicial procedures.

Before describing the causes of heavy loss of forest in the ACLAC and possible policy remedies, I will briefly describe the methodology, relevant content of the Forest Law of 1996, and the extent and consequences of the forest degradation taking place in this area of the country.

METHODOLOGY

The following examination of why substantial deforestation and thinning are taking place in the ACLAC is based upon qualitative data collected during field research in the region in 2002. I interviewed persons very knowledgeable about the subject, based on their direct involvement in or active observation of the local implementation of the Forest Law of 1996. Because the interviews were intensive, discussions with six such persons provided a large quantity of data. Additionally, interviewing six persons allowed me to gain perspectives from various institutions, including government, local indigenous organizations, and local environmental nongovernmental organizations.

Also indicating the utility of carrying out six interviews, by the last interview much information was being repeated, making identification of key causal factors clear. Basically, I asked informants to identify key actors in the deforestation or heavy thinning of forests in the ACLAC, the nature of their behavior, and important characteristics of the broader political, economic, and social context. To foster open discussion of controversial subjects, such as corruption, these interviewees remain anonymous.

KEY PROVISIONS OF THE FOREST LAW OF 1996

In the ACLAC, substantial forest loss has taken place despite efforts to check it through invoking the Forest Law of 1996. This law is truly a “sustainable development” policy, as it is aimed not only at protecting the forests, but also fostering economic growth through

support to the forestry sector, social equity through support to campesinos (peasants) involved in forestry, and democracy by creating inclusive policymaking bodies.

Several provisions of this law are most relevant to the goal of protecting forests. For the first time in Costa Rica, Article 19 banned clear-cutting in forests, even for the establishment of forest plantations. However, a loophole in this prohibition is its definition of “forests.” This definition, laid out in Article 3(d), is highly complicated as well as subjective. It requires that trees cover an area of two or more hectares, be mature but of varying ages, be of varying species, have one or more canopies that cover more than 70% of the area, and contain more than sixty trees of fifteen or more centimeters in diameter per hectare (Asamblea Legislativa, 1996, pp. 3883, 3898). Problematically for the goal of environmental protection, clear-cutting is possible where public authorities determine that a particular area does not fall within this definition of forests.

In the case of areas determined to, indeed, be forest, Article 20 explains that logging will be controlled through a permit called a “management plan.” In addition to the ban on clear-cutting, regulations implementing the Forest Law of 1996 dictate the necessary components of a management plan. For instance, explained one interviewee, a management plan must assure that mature trees are left for seeding, trees that are scarce in the area are not extracted, and at least 40 percent of each commercial tree species is left in place. Outside of forests, a management plan is not required.

Article 28 explains that forest plantations as well as “agroforestry systems and trees planted individually” do not require a permit for logging, or for transporting, industrializing, and exporting the wood (Asamblea Legislativa, 1996, pp. 3899, 3905). While agroforestry basically entails the cultivation of crops among trees that might also be harvested, the meaning of “trees planted individually” is much less clear. In practice, Article 28 has been interpreted to broadly exempt areas outside of forests from obtaining the otherwise-required permits. On such lands, only a “forest inventory” must be completed before logging can take place. An interviewee described the forest inventory as simply a declaration of the basic profile of the trees in an area, such as how many trees there are, the species present, and diameter and height of the trees. After

this document has been developed by a public official, often that official allows extensive logging, and sometime clear-cutting, to take place.

Determining whether an area is a forest is left to two different regulators. Article 21 explains that “forest regents” will be responsible for designing management plans and monitoring their execution. Although not government employees, these professionals in forestry are granted “public faith” to carry out these functions. In practice, this regulator first determines whether the area to be logged is a forest as defined by the Forest Law of 1996. If yes, the forest regent develops a management plan; if not, the forest regent compiles a forest inventory and has greater discretion in determining the amount of logging to be allowed.

As declared in Articles 6(b) and (c), it is still necessary for the Ministerio de Ambiente y Energía (MINAE) (Ministry of Environment and Energy) to approve management plans and help monitor their execution (Asamblea Legislativa, 1996, pp. 3886, 3900). The Sistema Nacional de Áreas de Conservación (SINAC) (National System of Conservation Areas), which forms a part of MINAE, does the legwork. SINAC is the system of conservation regions into which the Costa Rican territory is divided, of which the ACLAC is one regional division. Within the ACLAC, officials at the regional and sub-regional offices approve and oversee the use of management plans.

The Forest Law of 1996 also regulates the transport and processing of wood. As described above, Article 28 declares that no permits are necessary for transporting and industrializing wood originating from forest plantations, agroforestry systems, and other areas outside of forests. In contrast, Article 56 declares that logs and boards originating from forests cannot be transported without proper documentation. More specific requirements for this manifest are dictated through implementing regulations. Article 55 further declares that anyone possessing logs or boards, including wood processors (e.g., sawmills and furniture manufacturers), must be able to show an associated logging permit. Of course, if logs or boards originated in areas outside of forests, then the processor will have no management plan to show authorities. To enforce these requirements, Article 6(g) calls upon MINAE to carry out inspections of wood being transported as well as processed

(Asamblea Legislativa, 1996, pp. 3887, 3927-3928). Once again, these responsibilities have been carried out by functionaries at the ACLAC regional and sub-regional offices. The police also assist in inspecting wood transporters.

MAJOR FOREST LOSS AND ITS CONSEQUENCES

In spite of these provisions in the Forest Law of 1996, serious forest loss is taking place in several areas of Costa Rica. To be sure, the overall deforestation rate in Costa Rica has decreased. A study by the Centro Científico Tropical (CCT) (Tropical Science Center) and the University of Costa Rica estimated that on average 12,000 hectares of forest were lost per year between 1987 and 1997. A follow-up analysis by the CCT and the University of Alberta estimated that, on average between 1997 and 2000, this rate had gone down to 3,000 hectares annually (Laboratorio de Sistemas de Observación Terrestre [EOSL] & Centro Científico Tropical [CCT], 2002, p. 9). Environmental movement leader Alvaro Ugalde named several factors that have been most important in producing this reduction: the fact that not much forest is left in Costa Rica, the shrinkage of the country's cattle industry, economic incentives for the protection of forests established through the Forest Law of 1996, and an increase in the number of private forest reserves (A. Ugalde, personal interview, April 19, 2002).

Nevertheless, as demonstrated by satellite observation, large areas of forest are disappearing on the Osa Peninsula in the southwest of the country, in the Northern Zone, and in the Atlantic Zone, which includes the ACLAC (Centro Científico Tropical [CCT] & Centro de Investigaciones en Desarrollo Sostenible [CIEDES], 1998, pp. 12, 18; EOSL & CCT, 2002, p. 9). The problem on the Osa Peninsula has received the most attention in recent years, probably because the area harbors great biodiversity. For instance, one study found that mature forests on the Osa Peninsula contain the third highest species richness of 89 areas analyzed throughout the "Neotropics," which encompass Latin America and the Caribbean (Barrantes et al., 1999, p. 1).

The lands included within the ACLAC also contain a high level of biodiversity. In fact, because of the scenic beauty and scientific value of this biological diversity, La Amistad National Park, located

in the region, was declared a World Heritage Site. Interviewees explained that deforestation or other serious degradation of forests is occurring at many different sites within this region. However, this environmental damage is concentrated along a forest frontier inland from the Caribbean coast but not yet reaching the higher elevations of the Talamanca Cordillera. Recently, MINAE identified such loss of forests as the greatest threat to forest biodiversity in Costa Rica (Ministerio de Ambiente y Energía [MINAE] and Programa de las Naciones Unidas para el Medio Ambiente [PNUMA], 2002, p. 28).

Additionally, this process has negatively impacted rural communities in the ACLAC. For instance, some logging in this region is taking place illegally in aquifer recharge areas, threatening the supply of drinking water (Jiménez, 2002, p. 16A). Furthermore, an interviewee explained that excessive logging is exacerbating problems caused by banana plantations. Forests near rivers and streams that helped to slow the flow of rainwater into these waterways have been removed. With less buffer, water circulated through banana plantations by their many canals is more quickly reaching waterways, causing them to overflow into nearby communities.

Thus, substantial loss of forests in the ACLAC presents serious threats not only to local species and ecosystems, but also to the communities that rely upon these natural systems. The causes of this forest loss are explored below.

BEHIND THE DEFORESTATION AND HEAVY LOGGING

The interviewing revealed that the greatest damage to forests in the ACLAC is taking place on the land of campesinos, or peasants. Generally in Costa Rica, campesinos with land dedicate between 30 and 40% of their plot to subsistence farming (principally the cultivation of beans and corn), another 30 to 40% to commercial farming (principally the cultivation of coffee), and the rest to pasture. Additionally, some engage in forestry (Watson et al., 1998, p. 22).

However, as Seligson (1980) points out, Costa Rica's peasantry is diverse, including landholders and persons without land: landowners with title, landowners without title, squatters, renters, sharecroppers, steady nonplantation laborers, steady plantation

laborers, day laborers, and migrant workers. The titled landowners are the “elite” among peasants, as they have control over means of production, tenure security, and, although much poorer than most urban Costa Ricans, are significantly better off than the rest of the peasantry.

Nevertheless, the great majority of these landowners with title are smallholders. Specifically, Seligson (1980) found that 53% of titled landowners in Costa Rica hold less than 4 hectares of land, and 81% hold less than 10 hectares. Among landowners not holding title, he found that bills of sale that had not been notarized were the most frequently possessed proof of ownership. Other landowners without a title had no such proof of ownership (pp. 88-91).

Indigenous groups also live in rural sections of the ACLAC. In fact, the Talamanca Cordillera is the home of the majority of Costa Rica’s indigenous population. But in contrast to campesinos, informants agreed that indigenous communities are not significantly degrading forests. Typically indigenous peoples have cleared only small areas for subsistence agriculture and grazing.¹

Campesinos and Poverty

Key in leading peasants in this region to cut trees on their land is the fact that many live in poverty. Needing money in the short-term to meet basic needs and having limited options for obtaining such funds, campesino families often resort to felling trees to produce wood for sale and open land for crops and grazing. One interviewee explained that a cause of increased poverty along the Caribbean coast was the devastation of the region’s cacao crop by a disease in the 1980s.² Cahuita and Puerto Viejo on the southern coast suffered less because of budding tourism. But in other areas where cacao cultivation had played a major economic role, more people resorted to selling the trees on their land or even selling their land to banana companies. Some campesinos attempted to switch to banana cultivation but were often unable to compete with the prices offered by larger banana companies. More recently, banana production has decreased in the ACLAC. As a result, more people in the region are unemployed and likely to fell trees for quick revenue as well as opening space for subsistence farming and ranching.³

Rural poverty on the eastern side of the Talamanca Cordillera cannot be adequately understood, however, without the longer history of banana cultivation, exploitation, and discrimination. Until the late nineteenth century, the province of Limón was inhabited only by Native American groups. Because coffee, Costa Rica's chief export, was grown on the eastern slope of the cordillera that runs roughly down the center of the country, it made sense to develop a port on the Caribbean coast and land transportation connecting to the coffee plantations.

In 1871, the Costa Rican national government agreed to a contract with North American Henry Meiggs for the development of a railroad, which was later executed by his nephew Minor Keith. Laying the groundwork for current economic and social conditions in the region, Keith not only developed the railroad and a port in the town of Limón, but also acquired land from the Costa Rican government that he utilized to build a local economy based on large-scale banana cultivation. Construction and operation relied heavily upon migrant labor from the West Indies (Purcell, 1993, pp. 23, 25, 29).

As Seligson (1980) explained, the local banana industry came to form an "enclave economy":

The means of production were almost totally in the hands of the United Fruit Company: the plantations, roads, railroads, docks, and ships were either owned by, or on 99-year lease to, the Company. Plantations which were not owned by the Company were effectively controlled by it through its monopoly on transportation and exportation. (p. 57)

Further consolidating its power, Keith's United Fruit Company used various tactics to exploit its workers. For instance, it paid Anglos more than non-Anglos. It suppressed organized opposition by importing labor from different Caribbean islands. It encouraged divisions between Black and Hispanic laborers by using strike breakers of one group to respond to strikes initiated by the other (Purcell, 1993, pp. 30, 32). It also deported foreigners for union organizing or participating in strikes (Bourgeois, 1989, p. 215). Also discouraging economic development in the region, each time the company ceased production on infected or exhausted soils, it systematically destroyed the infrastructure it had constructed (railroads, bridges, telephone lines, etc.) to prevent competitors from

being able to renew production on a smaller scale (Bourgois, 1989, p. 8).

The Costa Rican government did not confront the United Fruit Company over such practices because “a conflict with the ‘Frutera’ meant a confrontation with the economic, political, and ultimately military power of the United States—a confrontation which Costa Rica was guaranteed to lose” (Seligson, 1980, p. 58). Furthermore, that company has historically had subsidiaries producing and purchasing bananas in several countries simultaneously, enabling it to pressure governments by threatening to relocate unless it is granted lower taxes and allowed to repress labor (Bourgois, 1989, pp. 19-20).

The precarious nature of this enclave economy was exhibited with the decline of banana cultivation early in the twentieth century, caused by leaf spot diseases, government and public opposition to the United Fruit Company’s discrimination that favored West Indians over Hispanics, and soil exhaustion. The company eventually relocated to Costa Rica’s Pacific coast. Because Blacks were prohibited from moving west beyond the town of Turrialba, many in the province of Limón were left in poverty from which they could not escape. In addition to paying wages, the United Fruit Company had provided for basic needs such as housing and health care (Purcell, 1993, pp. 28, 41, 43, 44). It was two decades before the Standard Fruit Company reinitiated large-scale banana production in the region in 1956, when a disease-resistant variety of banana was created (Seligson, 1980, p. 76).

This history of dependence and exploitation of the people and land explains why, even though Limón is once again the site of major banana cultivation and includes Costa Rica’s main commercial port, it remains poor and sparsely populated. Bourgois (1989) provides a vivid description of the substandard living conditions found in a community near the Panamanian border which relies on banana cultivation:

On the Costa Rican side of the border, where I spent most of my time, the stores and restaurants consisted of shanty stalls stretching single file along the muddy road paralleling the railroad that lead to the Panamanian border crossing at the Sixaola Bridge. Behind the shacks, sunken in a mud field, were the zinc-roofed cement structures of two brothels and a dance hall. This shanty town had emerged almost

overnight in 1978, when the company reopened its abandoned farms on the Costa Rican side of the border. Consequently, there was no provision for sewage or garbage disposal. Not surprisingly, alcoholism, venereal disease, petty crimes, and random violence abounded in this setting. (p. 5)

Campesinos and Insecure Land Tenure

Informants explained that insecure land tenure also leads rural inhabitants in the ACLAC to cut trees. In particular, “precaristas” (squatters) cut trees hoping to be awarded title to a piece of land. Squatters typically invade more attractive land sites, such as areas close to roads. Cutting trees allows them to make some money quickly by selling the wood and also opens up areas for agriculture and cattle-raising, allowing squatters to argue to the government that they should be granted a title because they have “improved” the land. Of course, since these persons do not have title to the land in question, they are cutting the trees illegally.⁴

One interviewee explained that squatting is a significant social problem in the ACLAC because the area was long characterized by a lack of regulation of land settlement. If someone lived on a piece of land and had developed it, by custom his ownership was respected. Thus, the attitude developed, still strong among squatters, that settlement on undeveloped land is acceptable. In many cases, the persons already living on such lands do not have legal title themselves, making them more vulnerable to ultimately losing their land to squatters.

These conditions are actually national in scope and have been fostered by government policies. Beginning in the early 1900s, as the price of coffee fluctuated and the population grew, agricultural wages decreased and unemployment increased. One response of the Costa Rican government was to create homestead laws that used the public domain lands in rural areas as an escape valve. These laws apparently gave every citizen a right to claim public lands but made no sustained effort to keep track of land grants. Most settlers never bothered to petition under the laws for more secure ownership. The vast majority of settlers believed that the right to claim land in the public domain also entailed having full ownership of the land, at least when it came to lands they had developed. Also most settlers were ignorant of titling rules or, even when they knew about them,

found it inconvenient to travel to the capital of San José to carry out complicated procedures (Saenz & Knight, 1971, part II, pp. 6-8).⁵

Exploiting the “Socular” Loophole

Driven by poverty, insecure land tenure, and other factors, campesinos in the ACLAC often clear trees by way of a process interviewees explained as “socular.” They begin by grubbing out the “sotobosque,” or the shorter and less thick vegetation surrounding large trees that are attractive for logging. Subsequently, they often plant beans, banana, and plantains or graze cattle within the space that has been opened.

Once a forest has been transformed into “arboles en potrero” (trees in pasture) or an agroforestry area, if one has title to the land in question then clear-cutting is legal under the Forest Law of 1996. As explained earlier, this law prohibits clearing areas within forests. However, because its definition of forests is highly complicated and subjective, it is comparatively easy to convince forest regents and ACLAC officials that an area is not a forest. In such an area, only a forest inventory is necessary, the degree of logging is left more to the discretion of the forest regent and government officials, and clear-cutting is possible. This situation has likely contributed to the fact that, in both 2001 and 2002, a larger portion of the wood extracted in Costa Rica derived from agricultural and ranching lands than from forests (Proyecto Estado de la Nación, 2002, p. 213; Proyecto Estado de la Nación, 2003, p. 242).

According to one informant, peasants are generally aware that eliminating the sotobosque may lead in turn to permission to log more extensively. However, another interviewee did not attribute such foresightedness to the peasants; rather they clear out the underbrush primarily to enable agroforestry and ranching.

Because clearing out sotobosque can lead to heavier logging, obstructing a major goal of the Forest Law of 1996, government officials have attempted to check this activity. Campesinos have responded by using various tactics to avoid detection. Interviewees explained that a common ploy is to clear away the vegetation surrounding trees during holidays and weekends when there are fewer enforcement officials on patrol.⁶ The informants also agreed

that a major barrier to better control to this activity is that SINAC has insufficient officials, vehicles, and funds.

The Role of “Madereros” and Forest Regents

Madereros are small logging and wood transporting companies, typically only owning one or two trucks and a tractor. As a result of the process described above, often when “madereros” (loggers) approach campesinos and offer to cut their trees, the land in question already includes pasture or agroforestry areas where logging can take place with only a forest inventory and where clear-cutting might be possible. However, one interviewee claimed that these loggers sometimes press campesinos to clear more sotobosque and also pressure landowners to allow more logging than they desire. While a landowner with 200 hectares of land might have hoped to log on only 80 hectares, the maderero might refuse to buy the landowner’s trees unless he permits logging on the entire 200 hectares. Furthermore, madereros often underpay peasants for their wood. The advantage to the maderero is obvious: logging more extensively in fewer locations lowers their expenses, and paying less for wood increases their profit.

Lowering the leverage of peasants in such situations is the fact that they often do not have the necessary equipment or time to cut their trees and take them to market and that they can seldom “shop” for more favorable terms with other madereros. Thus, peasant families have little choice but to give in to such offers.

Interviewees agreed that madereros have taken advantage of the campesinos’ economic need in the ACLAC to clear trees, reinforced by insecure land tenure. Making the maderero’s offer very attractive is the fact that, in addition to buying the wood they will extract, they are also typically willing to pay for all the necessary bureaucratic licenses. For instance, the maderero will likely offer to pay for the development of a management plan or forest inventory by a forest regent and for the campesino’s land title. Once again, this situation works to the advantage of the maderero in pressuring forest regents to allow heavier logging. First, madereros can argue that they are paying for the forest regent’s services and that the forestry engineer should therefore accommodate their requests. Second, madereros can threaten to switch to the services of a more cooperative forest regent.

In 2002 there were 482 licensed forest regents in Costa Rica (Proyecto Estado de la Nación, 2003, p. 244). Naturally, madereros usually continue a relationship with more accommodating regents. Third, madereros sometimes bribe forest regents in exchange for having them identify areas targeted for logging as pasture or agroforestry. However, because of the elimination of sotobosque, the targeted area has already been converted into pasture or agroforestry. In any case, once an area has been determined to not be a forest according to the law, madereros have then pressured forest regents to allow heavy logging following the development of a forest inventory. One interviewee contended that, although forest regents only rarely allow clear-cutting under such circumstances, they do commonly allow for more than 60 percent of trees to be eliminated.

In addition to improperly classifying target areas as non-forest, forestry engineers and madereros have engaged in other illegal activities. For example, an interviewee explained that sometimes forest regents design logging permits that misidentify tree species (thus allowing protected species to be cut) and that mislocate trees (thus allowing trees in off-limit areas, such as river banks, to be logged). Additionally, sometimes madereros violate legally sound logging permits. One interviewee explained that a maderero holding a valid permit will also log beyond its geographic limits, log too close to a river, or cut more trees than the permit allows. One informant emphasized, however, that such permit violations are uncommon.⁷

Whatever their relative importance, these various forms of illegal logging together account for a substantial amount of the total logging in the ACLAC. In a recent study, researchers at the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) (Tropical Agricultural Research and Higher Education Center) found that in the ACLAC, as well as in the Área de Conservación Tortuguero (ACTO) (Tortuguero Conservation Area) to the north, illegal logging accounted for about 37% of all logging--the highest rate among all the conservation areas studied (CATIE, 2001, p. 26).

Corruption, Lack of Resources, and Other Barriers

The clearing of sotobosque, classifying lands that are clearly covered in forest as pasture or agroforestry areas, other forms of

illegal activity, and heavy legal logging under forest inventories have all taken place during the watch of MINAE, specifically its officials at the regional and sub-regional offices of the ACLAC. These officials are responsible both for approving or denying the permitting decisions of forest regents and for helping these forestry professionals monitor the subsequent logging.

The interviewees indicate that corruption is one factor leading these enforcement officials to allow a greater degree of logging. A common form of corruption is an official in the ACLAC who approves an inadequate forest inventory or approves management plans that allow illegal logging. Interviewees explained that, while sometimes public functionaries are bribed (with the compensation usually coming from madereros), friendship networks are also very important in facilitating corruption. According to one interviewee, a strong compadre relationship may develop between ACLAC functionaries, forest regents, and persons working for maderero companies, who are all active in the same geographic area. These individuals interact closely and frequently and have sometimes known one another since school days and may socialize (“sometimes close enough to go out together for drinks”). As another source of corruption, one interviewee asserted that deputies in Costa Rica’s Legislative Assembly supportive of madereros have pressured leaders at MINAE to reduce enforcement efforts in the field.

Several other factors help explain why officials in the ACLAC have allowed so much logging in recent years. One informant emphasized that many MINAE employees have a “forestry mentality,” as they have an employment or educational background in this field. Another informant explained that, because the Forest Law of 1996 grants authority to forest regents to design logging permits, SINAC functionaries do not always do field inspections of planned logging sites. Finally, ACLAC regional and sub-regional offices have insufficient funds, employees, and equipment. One informant stated that a sub-regional office might be responsible for many remote logging sites spread out across a large area. And controlling logging is just one of the many responsibilities of such government officials.

Carlos Rodríguez, Minister of MINAE, agreed that the most important cause of illegal logging in Costa Rica is weak enforcement capacity. He emphasized that corruption occurs only “here and

there” within MINAE, ironically because its enforcement ability is so weak that it is not necessary to bribe its officials. Rodríguez added, “We have one of the least trained, least prepared enforcement units you could ever find in any country” (C. Rodríguez, personal interview, May 19, 2002). Similarly, the director of the Área de Conservación Arenal-Huetar Norte (ACA-HN) (Arenal-Huetar Norte Conservation Area) located in the Northern Zone identified insufficient enforcement capacity as the primary reason for illegal logging in that conservation area. He complained of insufficient enforcement personnel, especially at night and during holidays when such crimes are usually committed (Quesada, 2002, p. 4). In the Área de Conservación Osa (ACOSA) (Osa Conservation Area), the problem is similar: “There are only twenty vehicles, but only ten of them work; there is not enough gasoline, or personnel” (Calderón, 2001, p. 8A).

According to researchers at Costa Rica’s Proyecto Estado de la Nación (State of the Nation Project), the most important obstacle to SINAC’s functioning in general is its insufficient budget. Compounding this agency’s financial strain is the fact that funds must be diverted to pay persons whose land was appropriated to become part of protected areas. When it comes to national parks, biological reserves and national monuments, the government owes these landowners approximately US\$55 million (Proyecto Estado de la Nación, 2004, pp. 251-252). According to the Forest Law of 1996, some of the revenues from a tax on wood sales are supposed to be devoted to enforcement, but apparently this tax has not been collected because of vague provisions in the law (Murillo, 1999, p. 4A). Further still, the secretary general of the Workers Union at MINAE claimed that, not only has the budget for SINAC been decreasing, but also most of the funds provided to this system have gone toward administrative expenses, leaving only 40% of the budget for enforcement (Martínez, 1999, p. 4A).

Problems within SINAC itself might also be responsible for fewer resources being devoted to enforcement. A study by the Contraloría General de la República (Comptroller General of the Republic) of financial management within SINAC in 1999 and 2000 revealed important deficiencies, most notably inadequate data management and coordination between the multiple components of this large bureaucracy (Proyecto Estado de la Nación, 2003, p. 228).

Problems during Transporting and Processing

Government officials have also had a difficult time controlling the transport of illegally logged wood. Informants said that wood from the ACLAC is transported to towns within the region, such as Limón, Siquirres, Cahuita and Puerto Viejo, as well as to San José. Madereros often transport illegal wood at night, on weekends, or during holidays when there are fewer police on the roads. MINAE banned the transport of wood during the night (Herrera, 2002, 4A), but an informant contended that this rule was not being well implemented because many police officers were not aware of it.⁸ Additionally, corruption sometimes plays a role. For instance, an interviewee explained that madereros pay police at checkpoints to allow the passage of wood not accompanied by a proper manifest. Another informant asserted that madereros use “recycled” manifests that apply to wood moved in the past. For this strategy, the manifest cannot have been stamped at police checkpoints. Thus, the maderero must transport wood at night when checkpoints are not operating, bribe the police, or simply be on friendly terms with police officers. Further still, it was explained that in some cases SINAC officials have provided extra manifests to madereros.

According to interviewees, wood extracted from the ACLAC is mostly sold to sawmills, depositories, and furniture manufacturers. Madereros are in a much less advantageous position with these processors and depositories than they are with campesinos, regents, and sometimes government officials. Madereros seek to sell their wood as quickly as possible because they need to empty their one or two trucks so they can return to the forests and pick up more wood. As a result, madereros may feel compelled to accept lower prices offered by processors. Wood industries are also empowered when madereros attempt to sell illegal wood. Processors often demand a lower price because of the risk involved in using such wood.

Impunity: An Overarching Problem

Finally, interviewees agreed that all of those complicit in illegal logging, transport, and processing have been emboldened by the lack of enforcement. First, court proceedings are long and expensive, discouraging the government from prosecuting. Second, they reported that landowners can avoid guilt by claiming ignorance of a

maderero's illegal acts. The maderero can in turn argue the same regarding a contracted logger, and this sequence continues until the prosecution gives up, especially when someone who is named cannot be found or who is believed to have moved to another country. Third, the penalties in the Forest Law of 1996 are weak. Fourth, many judges are not very environmentally conscious. It comes as no surprise, then, that around 95% of accusations about violations of the Forest Law of 1996 are unsuccessful (Proyecto Estado de la Nación, 2003, p. 244).

ADDRESSING STRUCTURAL PROBLEMS AND THE PROMISE OF MARKET-BASED STRATEGIES

In sum, the key causes of deforestation and heavy logging in the ACLAC are poverty among campesinos, their insecure land tenure, corruption among government officials and forest regents, lack of sufficient enforcement funds, loopholes in the Forest Law of 1996, and ineffective judicial procedures. One general conclusion is that the primary engines of deforestation in Costa Rica appear to have evolved over time.

To be sure, certain causes appear well-entrenched. Brockett and Gottfried studied the command and control methods utilized to protect forests in Costa Rica in the 1970s and '80s and found that field personnel lacked the resources and knowledge to carry out effective enforcement. Furthermore, one of their informants commented that most landowners did not want to deal with the Dirección General Forestal (DGF) (General Forestry Directorate) (later incorporated into SINAC) because of excessive bureaucracy and corruption. Another informant complained that DGF field personnel were not dedicated to that agency's mission; low salaries, among other problems, encouraged corruption, which was as much a cause of illegal logging as the actions of landowners and loggers (Brockett & Gottfried, 2002, pp. 17-18). Also mirroring the findings documented in this chapter, [Brockett and Gottfried \(2002\)](#) found:

The difficulty of obtaining plans and permits has led landholders to rely often on loggers, who frequently have drawn up fraudulent management plans or bribed officials to obtain permits. The loggers set the terms of the contract, paying a low price to owners, and only for the wood they actually put on their truck (usually much less than what was

cut). The loggers extract only the best wood, “high-grading” the stands, and they often leave a heavily damaged forest behind. (p. 18)

However, the role of logging vis-à-vis agriculture appears to have increased over time. In contrast to this chapter’s finding that, in the ACLAC, since the late 1990s logging has been of central importance to deforestation and other degradation of forests, Brockett and Gottfried concluded that in Costa Rica deforestation has clearly been driven by the demand for more agricultural land rather than a demand for timber. Until the 1980s, most forests were cleared for ranching, which requires large tracts of land. Subsequently, as ranching began to pose less of a threat to forests, pressure from banana cultivation increased (Brockett & Gottfried, 2002, p. 16).⁹ Furthermore, campesinos now seem to play a more important role in deforestation. According to one study in the 1980s, campesinos cutting trees to meet basic needs were much less significant than larger-scale business interests engaged in ranching, coffee production, and wood extraction (Porrás & Villarreal, 1986, pp. 12-13).

Another general conclusion emerging from this analysis is that, in order to more effectively carry out the Forest Law of 1996, it will be necessary to tackle structural problems. Poverty, insecure land tenure, corruption, lack of sufficient funds, legal loopholes, and ineffective judicial procedures have led to heavy and sometimes illegal logging in the ACLAC. While the Forest Law of 1996 might be changed relatively quickly, the other problems are deeply ingrained and can be significantly reduced only over the longer term.

Considering these very formidable barriers to improved execution in the ACLAC of restrictions in the Forest Law of 1996, perhaps holding more promise in the short to medium term for controlling forest loss is a market-based approach rather than a command and control one. In the Forest Law of 1996 itself, the “pago de servicios ambientales” (payment for environmental services) (PSA) offers economic incentives for forest conservation, sustainable logging and reforestation. More specifically, the PSA program compensates the owners of forests who protect them or “manage” them (by logging them in a sustainable manner), and compensates the owners of forest plantations. This compensation is payment for their performing the “environmental services” of

sequestering greenhouse gas and harboring biodiversity (Asamblea Legislativa, 1996).

There is, in fact, strong evidence that this incentive scheme is useful in slowing forest loss. Between 1997 and 2001, this program provided financing to 4,461 persons, amounting to coverage of 284,430 hectares (MINAE & PNUMA, 2002, p. 137). Awardees were larger as well as smaller landholders, some involved in logging and others simply preserving their forests. In reference to recent forest cover studies indicating that net forest loss has finally stopped in Costa Rica, government officials argued that this incentive scheme has played a central role by encouraging increased preservation of forests as well as reforestation on private lands (Fondo Nacional de Financiamiento Forestal [FONAFIFO], 2002, p. 16).

Carlos Rodríguez of MINAE and environmental movement leader Alvaro Ugalde agreed. They contended that, although deforestation continues in Costa Rica, the annual rate has been decreasing in recent years, and this economic incentive has encouraged more people to maintain rather than to destroy their forests (C. Rodríguez, personal interview, May 16, 2002; A. Ugalde, personal interview, April 19, 2002). Illustrating how the PSA has reached the rural poor, between 1997 and 2001 indigenous communities received more than 221 million Costa Rican colones through this scheme (FONAFIFO, 2002, p. 74). According to the exchange rate of 360 colones per U.S. dollar, which was the case approximately midway through the following year of 2002, this amounted to roughly US\$614,000. In some cases, this financial assistance was crucial for families in these communities, as it was their primary source of income (FONAFIFO, 2002, p. 23).

Thus, while the structural barriers to improved regulation of forestry in the ACLAC might only be surmounted in the longer term, in the meantime, a useful way of suppressing forest loss would be to boost application of the PSA in that region. Paying campesinos to preserve the forest or to log in a sustainable manner helps to stop at its source the chain of events described earlier. At the same time, this market-based approach still encourages the development of the forestry sector, which has important values of its own.¹⁰

Costa Rica has provided a model for the rest of the developing world on how to successfully develop parks and other protected areas. Similarly, the strategy just outlined might provide a useful

model for other developing countries on how to better control forest loss on private lands. Indeed, the causes of forest loss vary widely across space and time. For instance, while logging operations have played a major role in deforestation in Southeast Asia and West Africa, they have recently played a minor part in Latin America, where an expansion in cattle ranching explains much of the recent increase in deforestation ([Rudel & Horowitz, 1993](#), p. 2).

There is still much in common, though, between the causes of deforestation in the ACLAC and those elsewhere in the developing world. Peasants have cleared large amounts of forest in Latin America as well as Asia and Africa, and poverty has been a key motive ([Dudley, Guilmour, & Jeanrenaud, 1996](#), p. 11; [Rudel & Horowitz, 1993](#), p. 2). In particular, in recent decades the landless poor have increased dramatically in tropical countries, leading to increased colonization of forested areas ([Johnson & Cabarle, 1995](#), p. 9). In the Peruvian Amazon, an average of 350,000 hectares of forest is cleared per year through shifting agriculture by migrants, who have come to the area primarily to escape impoverishment in the Andean highlands ([Bedoya Garland, 1995](#), pp. 218-219, 222).

Of course, it would be difficult to follow the strategy recommended for Costa Rica in other developing countries. In addition to the difficulty of carrying out major reforms aimed at reducing poverty and addressing other structural problems, implementing a PSA-like program would probably prove challenging. As [Brockett and Gottfried \(2002\)](#) explained, “Market alternatives traditionally have been denigrated in Latin America, not only because of the underdevelopment of markets and the region’s statist heritage, but because of a generalized distrust of capitalism” ([Brockett & Gottfried, 2002](#), p. 22).

NOTES

1. The two largest indigenous groups in the region, the Bribri and Cabécar, are described as practicing agriculture that is itinerant and allowing cultivated areas to lay fallow, as well as carrying out small-scale cattle grazing, hunting, fishing, and gathering ([Borge & Villalobos, 1994](#), p. 16).

2. Following this outbreak of the monilia fungus, cacao has only been cultivated to a limited extent, such as organic production on a small scale in Limón Province’s cantones (counties) of Limón and

Talamanca (Junta de Administración Portuaria y de Desarrollo Económico de la Vertiente Atlántica [JAPDEVA], 2000, p. 77). The ACLAC accounts for a large part of the province of Limón, which is one of several provinces into which Costa Rica is divided.

3. In 1997, the unemployment rate in the province of Limón was higher than the national average (7.2% in comparison to 5.8%) (JAPDEVA, 2000, p. 71).

4. According to the Instituto de Desarrollo Agrario (IDA) (Agrarian Development Institute), in the Caribbean region 42 squatter groups recently invaded 8,869 hectares. There were 26 landless groups with the potential to settle an estimated 5,041 hectares (JAPDEVA, 2000, p. 87).

5. According to one inhabitant of coastal Talamanca, Alphaeus Buchanan, members of his community could not afford the services of lawyer to obtain a title. Furthermore, in the past, lawyers had convinced community members who were unable to read Spanish to sign documents in that language that caused them to lose their property (Palmer, 1994, p. 310).

6. Peasants often begin these activities farthest from roads and paths where patrolling takes place. Landowners also avoid using loud machinery. Furthermore, the vegetation surrounding trees is commonly cut very slowly, and clippings are cut into small pieces so that they will decay more quickly in the humid climate. In order to make clippings disappear faster, sometimes they are burned or covered with a poison. Additionally, poison is placed directly on larger trees in an effort to dry out their canopies, which will allow more light to pass through. With increased light, lower vegetation adapted to shade slowly dies away.

7. Finally, logging sometimes takes place without a management plan or forest inventory. The interview data point toward the conclusion that, for the most part, this type of illegal logging is carried out by campesinos felling a small number of trees. Peasants cut trees without a management plan or forest inventory because they are not aware of this requirement or because they are not able to obtain the necessary land title and cannot find a maderero willing to log without a management plan or inventory.

8. Additionally, illicit wood is moved in banana trucks with a layer of bananas on top, is covered with a concealing layer of sand in dump trucks, or is hidden in enclosed trucks. One informant only

partly in jest suggested that illegal wood might be hidden in a truck labeled “Galletas Pozuelo,” which is a popular cookie. Furthermore, wood types that are not authorized in the manifest are often included on logging trucks, but many police are not able to distinguish among different types of wood.

9. In Central America as a whole, the cattle sector has been in a crisis since the early 1980s. Edelman (1995) explains the relative decline in the importance of ranching for deforestation comes as a result not just of decreased demand for beef in the United States, but also because of many other factors originating both in the United States and Central America. For instance, in the late 1970s the U.S. government discouraged beef imports by decreasing import quotas during expansive phases of the U.S. cattle cycle. Also burdening beef producers in Costa Rica was unprecedented inflation in the early 1980s that led to a steep rise in interest rates (pp. 27, 29, 31).

10. According to recent assessments, in Costa Rica there are 7,280 businesses directly or indirectly linked to the forestry sector, entailing 48,000 jobs (Proyecto Estado de la Nación, 2004, pp. 271-272). This sector also contributes approximately 5% of the gross domestic product (Proyecto Estado de la Nación, 2003, p. 241).

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ACRONYMS

ACA-HN	Área de Conservación Arenal-Huetar Norte (Arenal-Huetar Norte Conservation Area)
ACLAC	Área de Conservación La Amistad-Caribe (Amistad-Caribe Conservation Area)
ACOSA	Área de Conservación Osa (Osa Conservation Area)s
ACTO	Área de Conservación Tortuguero (Tortuguero Conservation Area)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agricultural Research and Higher Education Center)
CCT	Centro Científico Tropical (Tropical Science Center)
DGF	Dirección General Forestal (General Forestry Directorate)
IDA	Instituto de Desarrollo Agrario (Agrarian Development Institute)
MINAE	Ministerio de Ambiente y Energía (Ministry of Environment and Energy)
PSA	pago de servicios ambientales (payment for environmental services)
SINAC	Sistema Nacional de Áreas de Conservación (National System of Conservation Areas)