

STATE POLICIES AND THE PRESERVATION
OF FOREST COVER:
Lessons from Contrasting Public-Policy Regimes
in Costa Rica*

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Abstract: This study evaluates the impact of state policies on forest cover in Costa Rica, focusing on the influence of public policies on private incentives for preserving forest cover. Three periods are analyzed: the "laissez-faire period" when high rates of deforestation were largely unrestrained; the "interventionist period" when state policies created protection for some wildlands, especially with the creation of parks and reserves, but when many regulatory policies produced mixed results at best; and the current "hybrid period" featuring major policy changes and mixing market-oriented and interventionist approaches but not always in a coherent design. Despite significant successes, current policies appear unlikely to provide sufficient incentive to maintain the desired amount of forest cover unless the international community compensates Costa Ricans for the benefits that their forests provide the world.

Costa Rica was once blanketed by some of the world's biologically richest forests. But deforestation, especially in recent decades, has left the country with only a few large blocks of forested land. In the 1970s, Costa Rica experienced what may have been the highest rate of deforestation in the world (Lehmann 1992, 67; Solórzano 1991, 17). Now that the country's

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frontier is gone, deforestation rates have declined, but the less visible process of forest degradation continues.¹

Costa Rica is also home to perhaps the most environmentally concerned citizens in Latin America as well as the most democratic political system. While the trees have been falling, Costa Rica has moved to protect its resources with an ambitious system of national parks and reserves. More than 11 percent of the country now enjoys absolute (legal) protection in national parks and biological reserves, with another 14 percent regulated by different types of protected zones, especially forest reserves and wildlife reserves. In the protected zones, almost all the land is privately owned (MIDEPLAN 1999). Actual conservation, however, has been constrained by limited state resources and intense pressures on the land from banana, cattle, and timber enterprises as well as a steadily expanding population.²

Our objective in this article is to provide a history and an assessment of the impact of state policies on Costa Rica's forest cover. We will focus particularly on the influence of public policies on private incentives for preserving forest cover. To succeed, policies must have goals that are feasible as well as laudable. Feasibility requires that at a minimum, those implementing policy have the resources and the will necessary to do what is expected and that the citizens who are targeted by the policy have sufficient reason to comply with its directives. Despite earlier failures in each of these respects, by the late 1990s officials were claiming success for recent policy innovations, arguing that reforestation and natural forest regeneration had surpassed deforestation over the prior decade.³

The Costa Rican case has significance that transcends its small size. Because of the country's special attributes—democratic stability, an educated and environmentally aware citizenry, and a more egalitarian culture than most—Costa Rica provides a “best-case scenario” for forest preservation. Furthermore, Costa Rica has been in the forefront internationally in its efforts to stem deforestation, preserve wild lands, and promote sustainable forestry. Costa Rica was one of the first countries to negotiate agreements to swap “debt for nature” and is now in the vanguard of attempts to sell

1. Costa Rican officials estimated the 1994 deforestation rate at 4,000 hectares annually, down from the peak of 50,000 hectares during the 1970s (Castro and Arias 1998, 6–8).

2. Among the works on deforestation or forest policy in Costa Rica are Augelli (1987), Barrantes and Castro (1999), Boza (1993), Budowski (1982), Carriere (1991), Castro and Arias (1998), Castro and Barrantes (1999), Gottfried, Brockett, and Davis (1994), Hartshorn (1982), Jones (1992), Lehmann (1992), Lutz and Daly (1991), Porras and Villarreal (1985), Segura et al. (1996), Silva (1997), Solórzano (1991), Thrupp (1990), Centro Científico Tropical (1992), Umaña and Brandon (1992), Watson et al. (1999), and World Bank (1993).

3. See, for example, Castro and Arias (1998, 14–16). The claim and its meaning proved controversial, however. See “Survey Shows More Forests,” *Tico Times*, 6 Mar 1998, p. 1; and “Sparks Fly in Forest Debate,” *Tico Times*, 27 Mar. 1998, p. 1. For background, see Sader and Joyce (1988).

carbon bonds, establish a market for wood futures, and pay forest owners for the environmental subsidies they provide (Barrantes, Camino, and Rodríguez 1998). More generally, the country has become a pioneer in “sustainable development.”⁴ Given Costa Rica’s importance in these areas, it is striking that no previous study has provided the historical synthesis and policy evaluation offered here. The timing is propitious: the 1990s witnessed active debate over these issues internationally—especially in Costa Rica, where the debate culminated with a series of major reforms in the last half of the decade. These reforms will be a major focus of our study.

THEORETICAL CONSIDERATIONS

The issue of how much forest is “appropriate” for a country to conserve is in part a normative question and therefore beyond full agreement. We propose two criteria as a minimal definition of appropriate forest cover: first, sufficient forest to protect soils that are unsuited for agriculture, especially those lands that are important to preserving watershed quality; and second, sufficient forest to preserve biological diversity of flora and fauna.⁵ In addition, forests also are often critical to the livelihood of local communities, and therefore the importance of preserving forest cover to their economic security is a major concern here.

The links among deforestation, erosion, and watershed degradation are easily established (Blaikie 1985; FAO 1989; Leonard 1987; Naiman 1992). A growing population, combined with concentrated landownership, has pushed Costa Rican peasants onto areas and lands that cannot sustain agriculture.⁶ Survival needs dictate short-term orientations. Loggers and peasants clear forests where soil fertility is not enough for more than a few years of crops without inputs of fertilizer. The farmers then convert the land to low-grade pasture. The cleared land is often steep and highly erodible. When timber interests motivated by quick profits and unconcerned about sustainable forestry cut their roads and trees, heavy tropical rains course down logging roads, skid trails, and cattle paths, washing away soil and silting rivers and dams. As a result, serious watershed deterioration due to defor-

4. President José María Figueres (1994–1998) aimed to turn Costa Rica “into a pilot project of sustainable development,” with the country “offering itself to the world as a ‘laboratory’ for this new development paradigm” (Figueres 1996, 190). Although he was an unpopular president, this objective appears to have been internalized widely throughout the country.

5. For similar understandings of appropriate forest cover, see McGaughey and Gregersen (1983), Panayotou and Ashton (1992), and Solórzano (1991). Optimally, deforested land best suited for forests and inappropriate for other uses would have its forest cover restored, a process now well underway in Costa Rica.

6. Although not as severe as elsewhere in Central America, landownership is highly concentrated in Costa Rica, with over half of the land held in the largest farms (Brockett 1998, 74–76).

estation occurs above virtually every hydroelectric plant in Costa Rica, with a high price in lost production and revenues. The best estimate of the loss to Costa Rica in the depreciation of the value of its forests, soils, and fisheries from 1970 to 1989 was the equivalent of the gross domestic product for an entire year (Solórzano 1991; see also USAID 1989, 14–15, annex E; Hartshorn 1982, 58).

The amount of forest cover required to conserve biodiversity cannot be specified with any precision, which would require knowledge of the ecology of individual species that is beyond the present capacity of tropical biology (Heywood and Stuart 1992; Johns 1992; Kramer, van Schail, and Johnson 1997). Because deforestation has been outracing science, the policy that best secures the maximum amount of forest cover at feasible costs, especially in contiguous blocks, is also the policy most likely to preserve the maximum number of species. Alvaro Umaña, former head of Costa Rica's natural resources ministry and one of the country's best-known conservationists, claimed that nearly 95 percent of Costa Rica's biodiversity would be preserved if the country succeeds in protecting in reality the quarter of its land that has protected status on paper (Umaña and Brandon 1992, 85).⁷

Unfortunately, Costa Rica's ambitious system of national parks and biological reserves are inadequately funded, minimally policed, and threatened by the encroachment of squatters, loggers, hunters, and miners as well as hostile former owners who have not yet been compensated.⁸ These publicly owned areas are also too small to guarantee the preservation of some species, including some of the most valued.⁹ Consequently, the preservation of biodiversity also requires preserving forest cover outside the parks, especially in adjacent buffer zones. These zones cover about 12 percent of the national territory and are primarily privately owned (about 80 percent). Current policy assumes that they will remain so (World Bank 1993, 53).

An appropriate amount of forest cover will not be maintained unless it is perceived as desirable by a country's people.¹⁰ The challenge is to find the right mix of material self-interest, state regulation and incentives, and environmental education to accomplish this goal. Critical for privately held lands is the belief by relevant actors that forest preservation is in their own material self-interest. This perspective is especially important given that about

7. About 6 percent of all species identified worldwide are found in Costa Rica, with 4 percent estimated as its probable share of all existing species. See "C.R. Revises Its Biodiversity Estimates," *Tico Times*, 15 Jan. 1999, p. 8.

8. About 100 million dollars are still owed to former owners (Castro and Arias 1998, 5).

9. Some species require large expanses of territory (like jaguars) while others migrate altitudinally (such as quetzals). The creation of "biological corridors" that tie fragmented areas together into larger, more ecologically diverse zones is receiving increased attention. See Boza (1994), García (1997), Hudson (1991), and Loiselle and Blake (1992).

10. Among many making this obvious but critical point, see Forster and Stanfield (1992), Gregersen et al. (1990), and Southgate and Whitaker (1992).

70 percent of privately owned primary forest is held by smaller landowners (USAID 1989, 12). Currently, there are only two ways in which a continuous income can be generated through the market from privately owned forested land: ecotourism or sustainable forest management of timber and non-timber products. An additional income source of increasing importance in Costa Rica consists of environmental service payments by the state to forest owners.

In 1994 tourism forged to the front as Costa Rica's leading earner of foreign exchange, surpassing bananas and coffee.¹¹ Many of the visitors are "ecotourists" attracted by the marvels of Costa Rica's natural endowment. In addition to reinforcing an economic rationale for the existence of national parks, tourism plays a beneficial role in preserving forest cover on privately held lands in at least two ways.¹² First, growing numbers of private landowners now cater to ecotourists on their own land, perceiving an economic incentive to maintain their forest cover rather than convert it to agricultural uses. Forested land is now reported to be more valuable than cleared land in several parts of Costa Rica (as in Dominical), and some financial institutions now accept forested land as collateral of higher value than cleared land. By the end of 1997, the Red Nacional de Reservas Privadas Naturales had sixty-nine affiliates covering more than 50,000 hectares (MIDEPLAN 1998, 266). Communities of small landowners are also taking advantage of ecotourism by developing their own ecolodges and ecotours.¹³ The second benefit is that other landholders (and community members) are now able to sell their services or products to the tourist trade, lessening the pressure on their own land as the source of their livelihood. Even so, ecotourism has limits as an income source due to market saturation as well as the carrying capacity of the natural and cultural attractions.

A number of forestry projects in Costa Rica are attempting to maximize the income potential of privately owned forest cover in a manner that is biologically and socially sustainable.¹⁴ Some projects focus on maximizing the sustainable extraction of timber, offering landholders a variety of

11. After a few years as the leading earner of foreign exchange, tourism was replaced by electronics in 1998, largely due to production at San José's new Intel plant. In the first half of 1999, booming production accounted for 38 percent of export earnings. See "Intel Still Boosting Economy," *Tico Times*, 20 Aug. 1999, p. 1.

12. A standard definition of ecotourism has been provided by the Ecotourism Society: "Responsible travel to natural areas that conserves the environment and improves the well-being of local people" (quoted in Honey 1999, 6). Relevant discussions of ecotourism include Aylward et al. (1996), Báez (1996), Boo (1990), Drake (1991), Honey (1999), Lindberg (1991), Southgate (1997), and Whelan (1991).

13. A story in the *Tico Times* cited eight community-owned tourism projects, but we have visited others not listed in this account. See "Farm Families Planting 'New Crop,' ... Ecotourism," *Tico Times*, 30 July 1999, p. 7.

14. One study in 1991 counted 311 ongoing or planned forestry projects with donor support (Watson et al. 1999, 40).

silvicultural techniques to manage the forest as a series of crops that are periodically harvested (usually through partial cutting) to maintain a continuous income.¹⁵ Forests also contain many economic goods besides timber, including fruits, nuts, fibers, latex, palm fronds, and medicinal substances. In the broader sense, sustainable forest management may be understood as including the sustainable extraction of a full portfolio of these goods. Accordingly, we understand sustainable forest management, following Andrew Howard and Juvenal Valerio, to mean “the cultivation and exploitation of timber and non-timber forest resources for economic gain leading to a perpetual, periodic yield of marketable products with strict preservation of capital” (1996, 36). This definition also includes the soil.

Yet many researchers remain dubious that sustainable forest management can provide an income superior to that of alternate land uses in the near and medium term, especially for smallholders.¹⁶ Even if it could, as some contend, this superior income still would not necessarily be an adequate income. If not, landholders might still choose to sell out after high-grading the forest (removing only the best wood) to take the natural capital with them as they leave. Furthermore, as sustainable forestry spreads through both example and extension services, the supply of timber and nontimber goods will increase, and prices will probably fall at some point, as has happened with more than one nontimber good (such as black pepper in Costa Rica).¹⁷

Costa Rica has a long history of subsidizing agriculture and, more recently, forestry. Agricultural subsidies often promoted forest clearing. But so too did even some of the subsidies targeting forestry (such as incentives for plantations). Consequently, the intention, funding, and impact of state subsidies have generated considerable debate. Most recently, attention has focused on international payments for the fixation of greenhouse gases and domestic funding for other environmental services provided by forests, as will be explored in this study.

The viability of these approaches to preserving private forest cover depends on market forces, which are in turn influenced by public policies.¹⁸ We have identified three different forest policy regimes that occurred se-

15. For general background, see Panayotou and Ashton (1992) and Poore (1989).

16. Contrast the hopeful findings of Howard and Valerio (1996) for Costa Rica with the more pessimistic results of Kishor and Constantino (1993). More generally, see Bawa and Seidler (1998), Johnson and Cabarle (1993), Rice et al. (1997), and Stedman-Edwards et al. (1997).

17. Researchers who look closely at the economic viability of the multiple-use strategies of traditional forest cultures often conclude that these strategies offer important lessons for contemporary silviculture and agroforestry. Yet these analysts remain cautious about market constraints on income possibilities (e.g., Browder 1989; Browder, ed., 1989; Plotkin and Famolare 1992; Redford and Padoch 1992; Southgate 1997).

18. A vast literature exists on state-market relations in Latin America. Among recent contributions specific to environmental and resource policy, the most helpful have been Ascher

quentially in twentieth-century Costa Rica: the *laissez-faire* policy regime, the interventionist regime, and the hybrid regime. Although each represents a qualitative change in approach from the preceding one, it is important to remember that these are analytic categories and that characteristics of prior periods persist into subsequent stages. For example, many individuals still retain the worldview that underlay the *laissez-faire* regime, and they therefore continue to resist policy changes that conflict with that perspective, sometimes with success.

Only three large blocks of forest remain in Costa Rica outside the national parks. They are located on the Osa Peninsula of the southwest, in the Talamanca area of the southeast, and along the central volcanic range and the area north of it. A fourth important forest is the internationally significant forest regeneration effort underway in the Area de Conservación Guanacaste (ACG), located in the northwest. After our repeated research visits to each area across a decade, these four regions were chosen as the empirical basis for our general points about forest preservation and forest policy in Costa Rica. In each region, we attempted to interview the broadest spectrum of persons possible, from peasants to project administrators, and to visit an array of programs from small community projects to large internationally funded undertakings. During this period, we made the same inclusive effort at the national level to interview a broad sample of important actors across different sectors and perspectives. Appendix 1 lists the acronyms used herein, while appendix 2 provides a list of our informants.

THE LAISSEZ-FAIRE FORESTRY REGIME BEFORE THE 1970S

Until recent years, deforestation in Costa Rica was constrained by neither law nor custom. John Augelli (1987) pointed out that Costa Rica's long history of expanding into virgin areas led citizens to imagine an abundant, almost limitless frontier; to develop a wasteful mentality toward soils, forests, and other resources; and to utilize slash-and-burn practices that placed little importance on conservation.¹⁹ Forest lands were considered worthless on the frontier, and an individual's reputation for hard work depended on the amount of land one cleared. The larger biological services of

(1999), Cortés-Salas (1995), Kaimowitz (1996), Keipi (1999), Munasinghe and McNealey (1994), and Stedman-Edwards et al. (1997).

19. Costa Rica has an indigenous population that has survived to the present, but it currently numbers only a few more than thirty thousand persons. Many are concentrated in some of the most important remaining forested areas, with their reserves constituting 6.3 percent of the national territory. By some estimates, however, more than half of this land is held by nonindigenous persons who are the agents of much deforestation (Chapin 1992, 6; World Bank 1993, 19). Nor are all indigenous people strict conservationists. As our interviews established, more than a few give greater priority to economic growth and increased material comfort.

forests, from protecting soil and water quality to sequestering carbon, went largely unnoticed (Segura et al. 1996, 1). Moreover, holders of uncleared land paid higher taxes than those with cleared land and were more vulnerable to squatters. Many landholders still view trees as “enemies” that must be removed before “productive use” can begin or titling becomes a possibility. As one peasant leader on the Osa Peninsula told us, “I used to love to cut the trees with my chainsaw. I loved to hear them fall.” He has since “seen the light” and now promotes sustainable forestry.

On the Costa Rican frontier, settlers generally occupied land by squatting. According to the Spanish legal code, settlers could acquire land by peacefully and continuously occupying the land for at least ten years, after which the squatter could then petition the Crown for a title (Augelli 1987). Throughout Latin America, squatters have demonstrated possession by clearing or “improving” the land. This practice was institutionalized in Costa Rica in 1941 by a law that permitted possession of up to 300 hectares on the frontier, as long as the occupant cleared at least half of the land and maintained cattle at the rate of one cow for every 5 hectares (Segura et al. 1996, 17). Such “improvements” yielded the landholder a possessory right that could be sold or used as a basis for obtaining title (although most frontier settlers in the past failed to register their land). Coming into the 1990s, about 60 percent of farms still lacked titles, and competing claims to ownership were prevalent (World Bank 1993, 10). Although the 1969 Ley Forestal prohibited further spontaneous settlements, enforcement has proved difficult, particularly in remote areas.

Privately owned lands throughout Costa Rica also have been preyed on by squatters, especially in remote areas. To land-hungry peasants, forested land has often been viewed as “unused land” too inviting to ignore. The frontier culture reinforced the belief that they could take possession through their own hard work. Even when the owner can demonstrate satisfactorily to the courts possession of a legal title, the owner must reimburse the squatter for the “improvements” (forest destruction), including wages. This vulnerability has discouraged some landowners from maintaining forest stands or from reforesting previously cleared areas. Owner insecurity has been doubled in areas close to national parks, where many landowners have feared expropriation for park expansion. This sense of insecurity has also created suspicion about the true purpose of internationally funded projects of sustainable forestry now operating in such areas. Examples of this problem can be found on both coasts: on the Osa Peninsula on the Pacific Coast and in the Talamanca region of the Caribbean, which is suffering the aftermath of the contentious creation of the Parque Nacional Cahuita in the 1970s and the Gandoca-Manzanillo Wildlife Refuge in 1985. The fact that many former landowners are still waiting for compensation for lands expropriated years ago to create protected areas constitutes a major source of current anxiety about potential park expansion.

The issue of land titling is especially problematic on the Osa Peninsula, which contains the largest remaining lowland rain forest on the Central American Pacific Coast and one of the richest areas in biodiversity in the Neotropical region. The Reserva Forestal Golfo Dulce contains 61,350 hectares (about 22 percent of the peninsula) and serves as a buffer around Parque Nacional Corcovado. Yet approximately a quarter of the reserve's forest cover had been cleared by the mid-1990s, largely for pasture and often close to the park itself (Maldonado 1997, 39). Rampant cutting remains a bitter controversy at the turn of the century. The typical survival strategy of the eight thousand residents of the reserve has been to sell timber and then use the cleared land for crops and cattle. But most of the reserve lands are unsuited for either purpose because of their steep slopes, fragile soils, and high levels of precipitation. After two to three years of crops, yields fall to such low levels that the farmer must clear new land once again. Sustainable forestry could potentially be part of a landowner's farming strategy, but until recently cutting permits required a land title.

Obtaining full title to one's land was a time-consuming and costly process that had to be completed in faraway San José until a 1996 reform opened an office in the area. In addition, the Ley Reserva Forestal states that to obtain full title, landholders within the reserve must prove that they have had possession of the land at least ten years prior to the establishment of the reserve. This requirement further complicated the process and proved to be impossible in many cases. As a result, at the start of the 1990s, only 5 percent of landholders on non-agrarian-reform lands in the reserve possessed full title to the land they occupied, and on the peninsula itself, only 10 percent.²⁰

Tenure insecurity often leads to deforestation. Landholders cannot be sure that they will not be evicted from the land before they can reap returns from it. Thus they often clear the forest quickly to establish good-faith possession. The cattle that usually replace crops quickly on the now degraded soil serve as collateral for bank loans. When farmers feel they must reap "the capital gains" of their forest while they can, they show little interest in sustainable forestry. Unfortunately, recent evidence indicates that tenure security does not necessarily reduce rates of land clearing (Jaramillo and Kelly 1999). This outcome has certainly been shown on the Osa Peninsula. A major reform in 1996 facilitated land titling and allowed farmers of

20. Close to one-third of the land in the reserve is administered by the Instituto de Desarrollo Agropecuario with that land in the possession of (but not owned by) about four hundred farmers, further complicating the ownership and titling picture in the Osa Peninsula. For more discussion of the area, see Campos (1991), Donovan (1994), Gottfried, Brockett, and Davis (1994), and Maldonado (1997). See also in the *Tico Times*: "Environmentalists Sue Officials," 15 May 1998, p. 5; "Ministers, Activists at Odds," 14 Aug. 1998, p. 1; "Plans to Cut 10,000 Trees Spark Furor," 29 Jan. 1999, p. 1; and "Call for Logging Ban Renewed," 20 Aug. 1999, p. 1.

nontitled land to obtain logging permits. Critics blame such changes for what they claim is "an impending ecological disaster in Osa."²¹

Deforestation in Costa Rica has clearly been driven by the demand for more agricultural land rather than by demand for timber, with agriculture the probable cause of more than 80 percent of total deforestation (Cortés-Salas 1995, 32). Up to 86 percent of the timber cut between 1955 and 1973 was either burned or left to rot on-site (Ashe 1978). Public policy under the traditional *laissez-faire* regime encouraged converting forests to agricultural use through subsidies such as protected prices, exemptions for input duties, fertilizer subsidies (World Bank 1993, 14–15), and especially credit policies. Until the 1980s, most forests were cleared for cattle grazing, which requires large extensions of land to be profitable. Generous tax credits and low-interest loans granted irrespective of land capability or tenure (and often subsidized by foreign agencies) provided a strong stimulus for clearing land for cattle (Brockett 1998, 48–51). Although the level of livestock credit has declined in recent years, it still represented one-quarter of all agricultural credit in 1989 while contributing only 10 percent to agricultural gross domestic product (World Bank 1993, 14). By this point, pastures covered about 47 percent of the national territory (Segura et al. 1996, 14). As the pressure from cattle on the forests lessened, that from banana growing increased, again encouraged by public policy. This banana expansion has been most pronounced in the northeast, where plantations have been established right up to the boundaries of Parque Nacional Tortuguero (Hunter 1994).

Whereas virtually all of Costa Rica was originally forested, the country's forests now cover less than 40 percent of national territory, even including secondary forests and plantations. Most of the deforestation has occurred since 1950. Yet about 60 percent of the country's land is suitable only for forestry or less intensive use (Centro Científico Tropical 1992, 14, 35; Harts-horn 1982). In other words, much of the land deforested was not appropriate for agriculture and has now become degraded pasture. By one authoritative account, over half of the land deforested between 1966 and 1989 was land that by its nature should have remained in forest (World Bank 1993, 3).²²

THE INTERVENTIONIST FORESTRY REGIME IN THE 1970S AND 1980S

Faced with rapid disappearing forests, the Costa Rican government responded with a multifaceted approach. First, the impressive system of national parks was created in the 1970s. Second, a complex regulatory frame-

21. *Tico Times*, 29 Jan. 1999, p. 1.

22. Now much of it is returning to forest. Officials estimate that 145,000 hectares were reforested in the ten years preceding 1998, at an investment of nearly a billion dollars (Castro and Arias 1998, 11).

work governing forestry on privately owned lands was established through the Ley Forestal of 1969 and its revisions of 1973, 1979, and 1986. Third, financial incentives were provided for reforestation, later for natural forest management, and then for forest preservation. The rate of deforestation slowed at some point in the 1980s, in part because fewer accessible forests were left to convert to agriculture. The interventionist regime played a part in this partial success, but it proved inadequate to the Herculean task and in some ways even contributed to the deforestation it attempted to combat.

Under the interventionist regime, all tree cutting in Costa Rica required a permit from the the Dirección General Forestal (DGF), the primary governmental agency charged with protecting the nation's remaining forests. To clear forested land for agriculture, a technical study has been required proving that such land use is suitable. Even when the cutting is selective within a natural forest, a permit has been required and a tax must be paid. And when cutting selectively, to obtain a permit a landowner has been required to have a management plan prepared by a forester registered with the DGF. These requirements were intended to ensure sustainable forestry and give landholders protection from squatters, in that filing a management plan would demonstrate active use of the land. In addition to these restrictions, the interventionist regime promoted many other mandates, including a prohibition on exporting logs.

The rationale for this regulatory approach to deforestation is apparent. Even some critics who later called for deregulation claim that the command-and-control approach was needed as a transitional period in Costa Rican forestry policy (Centro Científico Tropical 1992, 3). Nonetheless, our interviews found widespread criticism of the interventionist regime among many officials and actors with interests in the forestry sector. On the one hand, the Costa Rican government, especially its field personnel, have lacked the resources and the knowledge to provide the supervision required by this approach. On the other, the interventionist regime and its style of implementation created disincentives for sustainable forest management and thereby contributed to further deforestation.

To bolster governing capacity, the government created in 1986 the Ministerio de Recursos Naturales Energía y Minas (MIRENEM),²³ to which the DGF was transferred from the Ministerio de Agricultura y Ganadería (MAG) to enhance the DGF's position as the lead agency in forestry policy.²⁴ Still, as recently as 1990, the DGF had only 186 employees on its professional and technical staff, most of them working in San José. A World Bank study

23. In 1997 the Ministerio de Recursos Naturales, Energía y Minas (MIRENEM) was reorganized and renamed the Ministerio de Ambiente y Energía (MINAE).

24. The Servicio de Parques Nacional (SPN), formed in 1969, made the same move for similar reasons.

noted in 1993, “[T]he DGF admits to low morale and an inability to control wasteful deforestation or to implement incentive programs due to insufficient funding and staffing” (World Bank 1993, 18). The problem went far beyond funding, however. Just about everyone outside the DGF whom we interviewed expressed a low opinion of the agency, most finding it a substantial barrier to sustainable forestry. Most of our interviewees would agree with one top actor in the forestry sector who dismissed agency personnel as “paper pushers” who seldom got out into the field and with another who claimed that most landowners did not want to deal with the DGF because of bureaucratic delays and corruption. Another informant told us that DGF personnel in the field were poorly trained and lacked dedication to the agency’s stated mission because of low salaries, slow advancement, and too much scolding and too little encouragement from supervisors. Field personnel lacked commitment and fell prey to corruption. This former DGF employee maintained that illegal logging was due as much to DGF corruption as to actions of landowners and loggers. His experience centered on the Pacific Coast, but others testified to similar experiences throughout the country.²⁵ Even the environmental minister publicly attacked DGF corruption when announcing an administrative reorganization in May 1996.²⁶

Throughout Costa Rica, the national government has lacked the staff and expertise to process cutting permits and perform the necessary follow-up for verification and monitoring, much less to assist with the development of management plans. 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.

A management plan, properly devised and followed, can be an important tool for sustainable forestry. With such plans, inventories are taken of the distribution of species and the size of individual trees. The best locations for logging roads and trails are then identified. A harvesting plan is established that is supposedly sustainable. As with the overall regulatory approach, the rationale for management plans should be readily apparent. The government, however, has lacked the personnel and often the inclination to supervise the management called for in the plans. Instead, the usual contact with landowners has been at the point of approving the plan inside

25. On Tortuguero and Talamanca on the northern and southern Caribbean coast, see Segura et al. (1996, 22).

26. *Tico Times*, 7 May 1996, p. 5.

an office building at some distance from the forest, to the great inconvenience and irritation of the landowner.²⁷

For many landowners, the plans degenerated into a bureaucratic hurdle to be jumped to gain the desired cutting permits. In a country lacking a tradition of forest stewardship, the plans easily became "permit plans" for landowners rather than tools for sustainable forest management. Many of those interviewed in the forestry sector believed that this orientation toward permitting rather than managing has been shared by government personnel as well. One informant assumed that the government's true interest has been predicting how much in taxes it would be able to collect. Some research indicates that most plans are copies of each other (World Bank 1993, 12). They are seldom followed faithfully²⁸ and often do not even meet legal requirements.²⁹ For many smallholders, the required documentation, advance tax payments, multiple bureaucratic procedures, and constant revisions of the permit system became too expensive to endure. Instead, they have illegally harvested (or cut and burned their trees when they thought they could get away with it) or injured trees so that they could be removed after they died. Alternatively, loggers have prepared plans with no intention of following them, relying either on bribes or the knowledge that oversight usually is too limited to be a threat. Permits also are known to have been reused.

Another attempt made by the Costa Rican government to maintain adequate forest cover was to provide incentives first for reforestation and later for natural forests on a more limited basis. Initiated in 1979, the more important incentives for reforestation included income tax reductions, subsidized credit, and transferable bonds. The incentives succeeded in promoting the reforestation of some 51,000 hectares up to 1993 (Castro and Arias 1998, 9), but not without problems. Incentives originally were available to large landowners only, with new programs developed later in which smallholders could participate. As many as 22,000 smallholders signed up, generally through regional associations. Yet most of the income still went to largeholders. The World Bank estimated that in 1991, only 31 percent of projects involved plantations of less than 100 hectares, a cutoff point that would still include some large landowners (1993, 26).³⁰ Smallholders needed the subsidy most. Timber prices increased enough in recent years to make reforestation profitable for largeholders even without subsidies, as demon-

27. In addition to our interviews and observations, this section is also based on Barrau (1992), Cabarle et al. (1992), Barrantes, Camino, and Rodríguez (1998), and Segura et al. (1996).

28. *Tico Times*, 26 Feb. 1998, p. 7.

29. *Tico Times*, 20 Aug. 1999, p. 1.

30. Similar problems beset the incentives for natural forest management. Established in 1991, the Certificado de Abono Forestal para Manejo (CAFMA) required that at least 50 hectares be placed under forest management to be eligible.

strated by the rising rate of nonsubsidized reforestation. This trend led to proposals for eliminating the incentives (e.g., World Bank 1993, 47). After being forced by a structural adjustment program to cut back public-sector spending, all these deforestation incentives ended by 1995 except for one program targeting smallholders.

Even worse, the reforestation incentives sometimes promoted the destruction of primary forests. Allegations are often heard about largeholders clearing native forest and replacing it with subsidized plantations. Smallholders were also guilty of this practice. One led us on a steep climb to show with pride where he had reforested across the top of a ridge that once had been his beanfield. When asked where he grew his beans now, he became hazy and changed the subject. Assuming that he had cleared forest further up the mountainside, we decided not to press the issue. For some landowners, the point of reforesting was clearly harvesting not sustainable timber crops but the subsidies themselves. Official investigations as well as our own observations and interviews all indicate that some reforestation stands were not viable and others are producing low-quality trees because of inferior seeds, inappropriate species, poor locations, or limited or no silvicultural treatments (World Bank 1993, 26). Because the DGF was responsible for enforcing reforestation regulations, they were vulnerable to all the problems already discussed.

Finally, other regulations have also served to lower the economic value of timber. To stop the hemorrhaging of trees from its forests, in 1987 Costa Rica banned the export of logs and unprocessed timber.³¹ Combined with the existing import tariffs and permits, these regulations depressed domestic prices below international levels. For example, log prices for 1989–1991 were estimated to be 18 to 52 percent of the border price equivalents (World Bank 1993, 40).³² New sawmills were banned in 1987, which meant less competition among buyers, depressing incomes for suppliers.

Our fundamental point is that accomplishing social objectives through an interventionist approach depends on conditions that often are difficult to obtain. This generalization has certainly been true of Costa Rican forest policy. The agents of deforestation have acted in what appeared to them to be their material self-interest, behavior unconstrained (until recently) by any countervailing set of cultural values that would have been supplied by a traditional culture of forest stewardship. In such circumstances, a command-and-control approach requires substantial resources to succeed, especially considering that the targeted behavior usually occurs in remote areas with poor transportation and limited communication infrastructures. Given the isolated area where most enforcement would be carried out, field person-

31. This prohibition was later lifted for plantations.

32. By spring 1996, however, we heard unverified reports that at least in the Talamanca region, timber prices had risen above international prices by as much as 30 percent.

nel would have to be firmly dedicated to their agency's mission and invulnerable to corruption. To be fair to the DGF, after the ample criticism noted here, its mission became impossible.

THE HYBRID FORESTRY REGIME OF THE 1990S

The deficiencies of the interventionist approach have been widely debated in Costa Rica over the last decade, leading to multiple reform proposals but no consensus. A crucial agenda-setting role in this process was played by the UN Food and Agriculture Organization's global project of formulating and implementing country-specific Forestry Action Plans. A plan was initiated in Costa Rica in 1989 with important support from the Netherlands. A new forestry law became imperative in 1990, when the 1986 act was ruled an unconstitutional restriction of private property rights by the Sala Constitucional of the Corte Suprema. Achieving agreement on the desired direction of change, however, proved difficult. Finally in late 1995 and early 1996, the executive branch engineered significant administrative reform by decree, while the legislature took advantage of President José María Figueres's political weakness by passing a law that differed substantially from what the administration would have preferred. This new forestry regime is still emerging, but enough is already visible to know that it contains conflicting elements and an overall form produced not from a coherent design but from defeats and compromises among contending forces.

The process leading to the creation of this new regime involved numerous actors with various interests, views, and power capabilities. To simplify the situation, their debates have focused on three issues: the purpose of forests, the relative roles of the state and markets, and the merits of decentralization. To simplify even further, their differing positions on these issues created two loose and competing reform coalitions: the market-oriented coalition and the interventionist reform coalition.

One argument among these forces has focused on the future of the remaining blocks of forests outside the national parks. Some actors stress these forests' value in terms other than forestry products, such as biodiversity, water quality, and carbon sequestration. Others emphasize their importance for timber production. The latter group may be divided into those most interested in maximizing the productivity of the sector as a whole (usually more oriented to the needs of larger producers) and those more interested in forestry as one means of fostering adequate living standards for smallholders.

All these groups face the question of how forests can best be protected for their intended purpose. The failures of the interventionist regime are widely recognized. Furthermore, annual public deficits with growing domestic public debt as well as immense international debts have made it difficult throughout the 1990s to obtain financing for major statist approaches.

Moreover, key sources of international financing (the United States, the World Bank, and the Inter-American Development Bank) have conditioned assistance on scaling back the scope of the state. Yet existing protected areas are woefully understaffed. One example is the enormous challenge of policing the Refugio Nacional de Fauna Silvestre Gandoca-Manzanillo on the southern Caribbean coast, where about 90 percent of the land is privately held. Only recently has the state paid the salaries of reserve personnel, which were previously paid by a nongovernmental organization (NGO). By the late 1990s, the government still could afford to place only three full-time staff members in the reserve at any time. Similarly, the Osa Peninsula had only three staff members monitoring compliance with management plans as recently as 1998.³³

But 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 that transcends classes, especially among intellectuals. Accordingly, many Costa Rican actors with a conservationist priority or a primary concern for the smallholder have not been ready to embrace many of the market-oriented proposals of recent years.

Public power in Latin America traditionally has been centralized. A final dimension of environmental controversy concerns the desirability of decentralization. This issue is especially important for forest policy because the object of policy is not located in the capital city. As the frontier has been pushed back over the decades, so too has the distance between the policy-makers and their targets. While the merits of decentralization may be apparent, many conservationists remain wary because they fear that local timber interests can dominate policy better the more power is shifted from San José to outlying areas. In fact, a short-term policy shift beginning in 1996 that allowed municipal governments to issue logging permits led to widespread charges of corruption.³⁴

The key assumption of the market-oriented coalition is that forest preservation on private lands must be recast in the material self-interest of landholders by making timber itself more valuable. Costa Rican forestry producers and intellectuals have been key actors in this coalition. For example, much of the intellectual force behind the critique of the interventionist regime and corresponding reform proposals came from the highly respected team assembled at the Centro Científico Tropical (CCT) in San José. International actors have also been critical. USAID officials freely acknowledged to us their influence on behalf of liberalization in Costa Rica,

33. Our interviews are corroborated by two articles in the *Tico Times*, 15 May 1998, p. 5; and 12 June 1998, p. 1.

34. *Tico Times*, 29 Jan. 1998.

generally and in the forestry sector. The United States has expended considerable funds in recent years on forestry projects in the country.³⁵ Such projects' dependence on continuing funding has given the United States substantial leverage (Tolisano et al. 1993).

Both USAID and the CCT also played important roles in consensus building, as did the World Bank. One objective of USAID was to help organize the historically weak private forestry sector. The hope was that better organization would increase the chances for public policy supportive of sustainable forestry in the inevitable competition with other interests, such as agriculture and conservation. To this end, USAID played a major role in the creation of a national forestry council, the *Cámara Costarricense Forestal* (CCF). The agency financed trips for sector leaders to visit counterparts in the United States and Chile and later for legislators to visit Chile and Venezuela. USAID officials also worked closely with the Figueres administration in drafting a reform bill. The World Bank study served as a discussion document for a series of meetings conducted in the summer of 1993 with leaders across the forestry sector. This process was pushed along by the CCT's report, "Forest Policy for Costa Rica," which was released in September 1992. Prepared at the request of the Costa Rican government and financed by USAID, the report was viewed as a consensus-building document. It had been guided by an advisory committee of members drawn from key leaders across the sector.

The Forest Reform of 1996

Actually formulating a new law proved to be more difficult. This effort involved key individuals from the DGF, the Tropical Forestry Action Plan sponsored by the Food and Agriculture Organization (FAO), and the private sector as well as ample consultation with other top actors, including USAID. But before the process could be completed, time ran out on the presidential term of Rafael Calderón. The elections in February 1994 brought a change in party control of the executive, leading to further delays. And an even bigger problem loomed: this was not the only reform coalition nor the only proposed law.

Concurrently, another coalition had formed constituting actors with primary commitments to conservation, smallholder forestry, or those less

35. USAID efforts accelerated into the mid-1990s because the mission in Costa Rica was closing in late 1996. These efforts focused especially on REFORMA (Reform for Forest Management), a 2.8 million-dollar multifaceted project that included research, training, public education, and enforcement, notably the establishment of checkpoints on the single roads that led out of each of the three areas where most of the remaining forests outside parks are located. The checkpoints have been less successful than hoped, as can be deduced from recent controversies discussed here concerning continuing illegal logging.

convinced of the merits of deregulation.³⁶ This coalition was especially strong in the national legislature and in executive agencies below the ministerial level. It also enjoyed backing from the Netherlands. A national association formed in 1991 by organizations of small and medium forest owners, the Junta Nacional Forestal Campesina or JUNAFORCA, also played an important role in challenging the market-oriented viewpoint in the policy process, fighting first as part of the forestry council (CCF) and then from outside.³⁷

By the fall of 1994, the two coalitions had forged a consensus bill, but it languished in the legislature. To the surprise of most observers, it was superseded by a bill with a different approach. This proposal had been drafted by a few legislators who got the Legislative Assembly to pass it in late 1995 so that it became law in February 1996. Although still a compromise, the new law leaned further toward the conservationist and smallholder viewpoints of those in the interventionist coalition than the Figueres administration wanted and more than the 1994 compromise. Passage of this bill resulted from a serious revolt that President Figueres was facing within his own party due to disputes over other issues. Given his weak political position, vetoing the bill was apparently out of the question.³⁸

The new law created mechanisms for stakeholder participation in forestry policy making and for the creation and distribution of subsidies for preserving forest cover. Less of the new law addressed the concerns about existing policy creating disincentives for sustainable forestry on private lands. Relevant sections of the 1996 law covered six major points.³⁹

The law prohibited cutting trees or converting use of private lands determined to be essential to biodiversity or watershed protection (Article 2). Similarly, if private land is under forest cover, conversion of use (including

36. In addition to mining our interviews, our understanding of this second coalition draws on Silva (1997). Also see Kaimowitz (1998).

37. JUNAFORCA pulled out of the CCF in 1996, claiming that smallholder interests were not being served by the council but instead were being used for symbolic purposes by larger interests. In the late 1990s, JUNAFORCA consisted of 56 organizations representing about 27,000 producers (Watson et al. 1999, 21).

38. Figueres was elected in part because of his opposition to the neoliberal program of his predecessor from the rival Partido Unidad Social Cristiano (PUSC). Once in office, however, Figueres came to believe that the situation facing Costa Rica required continuing the neoliberal project. He acted accordingly, alienating many in his own party. To bolster his public position, Figueres unilaterally forged a pact with former president Rafael Calderón, which further alienated many in his party, including members of Congress where his Partido Liberación Nacional (PLN) held the majority. His support never recovered. Throughout his tenure, Figueres's popularity ratings ran below average, and his term ended with the lowest numbers recorded. For an end-of-term assessment, see the series in the *Tico Times*, 1, 8, and 15 May 1998.

39. The Ley Forestal, Ley No. 7575, was promulgated on 5 Feb. 1996. Implementing regulations were published 23 Jan. 1997 (no. 25721, MINAE).

conversion to plantations) is prohibited (Article 19). Given the little forested land left in Costa Rica that is suitable for agriculture, this regulation seems important and appropriate.

The law simplified the requirement for forest management plans. Instead of the burdensome mandate of annual approval, plans may now cover a number of years, postponing reauthorization until the period specified in the plan expires. Seasonal restrictions on when trees can be harvested have also been lifted (Articles 20–21). In terms of lowering costs to owners so that sustainable forestry can become economically viable, it is uncertain that these changes go far enough, especially for smallholders. Even under the new simplified procedures, many landholders will still find compliance too cumbersome and irritating. Where feasible, they probably will continue to cut illegally.⁴⁰

The legislation also created the Oficina Nacional Forestal (ONF), consisting of representatives of forestry producers (two of which must be small producers), wood and furniture industries, the commercial sector, and one representative of environmental organizations. With its own financing specified by the law, the nine-person ONF is to serve in a policy advisory role to the minister of the environment (Articles 7–11). A number of our contacts emphasized the traditional weakness and disorganization of the private forestry sector in Costa Rica and its inability to assert its interests successfully before the state, especially the DGF. The ONF offers the possibility for significant improvement in this regard in a representative fashion due to the mandated inclusion of small producers.

The law deregulated forestry plantations, eliminating any need for permits for harvesting, transporting, industrializing, or exporting plantation timber (Article 28). It also created a new subsidy to be paid to landowners in recognition of the uncompensated environmental services provided by forests (Articles 22–27). Finally, the law created a national forestry fund, the Fondo Nacional de Financiamiento Forestal (FONAFIFO), to support financially the forestry activities of small and medium producers (Articles 46–51).

Administrative Restructuring

The Figueres team managed to achieve some of its objectives administratively, moving in 1995 to decentralize substantially and to coordinate more effectively the conduct of environmental policy by creating within the Ministerio de Ambiente y Energía (MINAE) the Sistema Nacional de Areas de Conservación. SINAC now divides Costa Rica into eleven conser-

40. Regulations implementing the law established the Comisión Nacional de Certificación, consisting of eight members from the scientific community to set the sustainability standards on which the management plans are to be based (Alfaro et al. 1998).

vation areas, each including protected parks, privately owned forested buffer zones, and the surrounding agricultural land. Each area is intended to be largely autonomous in financing and administration. Accordingly, the national and regional offices of the forestry service (the DGF), the Dirección Vida Silvestre (DVS), and the Servicio de Parques Nacional (SPN) have been integrated into each conservation area. Many of the San José personnel were moved into the field. As a result, the DGF no longer exists as a separate entity. Mechanisms for public participation are also being established. Regional environmental councils with diversified memberships and wide-ranging responsibilities, including an advisory role within the SINAC structure, were mandated by executive decree in 1993 and then by the Ley Forestal and a counterpart Ley Orgánica del Ambiente passed in 1995.⁴¹

Decentralization, improved coordination, and democratization are all needed. These recent changes are so far-reaching, however, that difficulties in implementation were inevitable, especially given the multitude of conflicting interests in this policy area. Most significant is how quickly the new structure has been legitimated. Established by executive order after years of legislative inaction, SINAC and its position have been strengthened by subsequent legislative action. Party control of the executive changed with the election in 1998 of Miguel Angel Rodríguez, but his administration has retained this structure.

Perhaps the biggest challenge comes with decentralization. Each conservation area is expected to secure many of its own resources, but they vary considerably in their ability to do so. For example, as USAID was getting ready to leave Costa Rica, it invested substantial funds in FUNDECOR, an endowment for supporting programs in the Area de Conservación Cordillera Volcánica Central.⁴² The well-known dry-forest regeneration project in the Area de Conservación Guanacaste had an endowment of around twelve million dollars in 1998 (Jirón 1998), due in large part to the efforts of Dan Janzen of the University of Pennsylvania. The Area de Conservación Arenal has been favored by the Canadian government. Its project in the area ended in 1999 with the creation of an endowment for that area, the Fundación para el Desarrollo de la Area de Conservación Arenal (FUNDACA). Funding for the other conservation areas, however, is lagging behind, sometimes significantly and with some resentment. The difference can be seen in their uniforms: all staff in the Guanacaste Conservation Area, from cooks

41. The Ley Orgánica del Ambiente, Ley No. 7554, was promulgated 28 Sept. 1995. A third law in this series, the Ley de la Biodiversidad, Law no. 7788, was approved in April 1998.

42. Beginning in 1989, the seven-year FORESTA project put 7.5 million dollars into the area, much of it funneled through FUNDECOR to get the project started. As part of the project, Costa Rica placed the equivalent of 10 million dollars into its endowment with funds from USAID Economic Support Fund-generated local currency (USAID 1989). For a recent report on FUNDECOR, see "FUNDECOR! Turning Theory into Practice," *Tico Times*, 19 Sept. 1997, p. 7.

and guides to administrators, wear new uniforms featuring an ACG insignia. In some other areas, their counterparts are still wearing the older uniforms of their former services.

Integration of the previously separate services seems to be proceeding well overall. But some environmentalists worry that their conservationist priorities will be weakened by the multiuse orientation of SINAC.⁴³ These apprehensions are reinforced by SINAC's participatory mechanisms. Although attitudinal change in many local communities appears to be evolving from a short-term extractive orientation to at least the rhetoric of sustainable development, few residents in rural communities are preservationists.

Finally, nongovernmental organizations are playing a significant role in the new policy regime. NGO activities on behalf of sustainable forestry have expanded in recent years, especially after passage of a 1986 law providing that 10 percent of forest taxes be distributed to regional organizations for forestry projects. Promotional efforts by these organizations range from environmental education activities to innovations created to strengthen demand for timber and to increase the share of the price to the landholder. A major objective has been to increase domestic demand through value-added activities close to the forest. In some cases, the wood products enterprises are controlled cooperatively by landowners, further increasing incomes from their timber. These projects also strengthen landholders' bargaining position with loggers by helping them gain higher prices for their timber. Vertical integration goes further in some areas, with smallholders through their local organization cooperatively logging and hauling logs to their own small mill. The project of the Asociación San Migueleña de Conservación y Desarrollo (ASOCODE) in the southeastern corner of the country, for example, saw a fivefold increase in the price members are paid for their trees in just a few years. In addition, some of these projects provide key extension services, such as helping to prepare management plans.

Policy changes allowing NGOs to assume what were formerly state responsibilities for overseeing compliance with forestry regulations seem to many of our interviewees a promising approach to enforcement in the field. NGOs consisting of local landowners and entrepreneurs have a capability and self-interest inherently lacking in the state sector. In providing extension services to landowners such as management plan preparation, the NGO assumes responsibility for landowner compliance and therefore oversight responsibilities. A good example is the Comisión de Desarrollo Forestal de San Carlos (CODEFORSA) in the San Carlos region of the Area de Conservación Cordillera Volcánica Central.

A cautionary note is in order, however, given the considerable academic literature on the dangers of a state delegating its functions to the pri-

43. This concern was often expressed to us. More generally, see Kramer, van Schail, and Johnson (1997).

vate sector.⁴⁴ Such delegation can serve at times as an instrument for private producers to protect their private interest against a larger public good, as in maintaining artificially high prices or discouraging the entry of new producers. To the extent that local NGOs writing management plans and overseeing landowner compliance are watched by the state (the decentralization of SINAC would seem important here), then the system may work. Also potentially important is oversight provided by international forest-certification NGOs. Although this movement is still in its early stages, groups like the Forest Stewardship Council (backed especially by the World Wildlife Fund) certify the environmental and social practices of private companies and organizations. Certification in turn is supposed to bring landowners higher prices as global consumers demonstrate a willingness to pay higher prices for sound practices. As of 1997, FUNDECOR and five private companies in Costa Rica had earned such certification.⁴⁵

Environmental Service Payments

The market orientation of recent years has been especially innovative in creating payments for environmental services. Forests provide many goods and services to society (positive externalities) for which forest owners anywhere have seldom been compensated. If they were, one argument runs, then the additional income received might be enough to make private forest conservation economically viable. If owners were compensated for watershed protection, carbon sequestration and storage, biodiversity preservation, and amenity values, this additional income would transform the long-standing debate as to whether sustainable forestry can be economically competitive with alternatives such as conversion to pasture or plantations.⁴⁶ This “getting prices right” (in a much fuller sense) also runs in the opposite direction. If consumers are expected to pay the “real costs” of environmental services, such as the cost of forgoing the conversion of water-producing forests to degraded pastures, then their behavior will change in ways desired by conservationists, whether the consumer shares conservationist values or not.

Recent policy innovations in Costa Rica incorporating this new orientation toward environmental services place the country in the forefront internationally. While Costa Rica has sought funding for these payments at

44. The cornerstone of this literature is Lowi (1969).

45. Concerning certification in Costa Rica, see Alfaro et al. (1998). More generally see Centeno (1995), Johnson and Cabarle (1993), and Simula (1999).

46. For an elaboration of this argument specific to Costa Rica, see Kishor and Constantino (1993 and 1994). One rough estimate places the value of goods and services produced in 1996 by Costa Rica’s biodiversity at 319 million dollars, or 3.5 percent of that year’s gross domestic product (Barrantes and Castro 1999, 47). More generally, see Dourojeanni (1999) and Haltia and Keipi (1999).

the global level, the country has moved assertively to create domestic funding sources as well. The new administrative branches of SINAC have been integrated into this effort, providing a sound set of structures and processes for allocating payments to landholders. Implementation problems have occurred nonetheless.

To compensate owners for the environmental services provided by their forested land, both tax certificates and direct payments have been instituted.⁴⁷ The Certificado para la Conservación del Bosque (CCB) may be used to pay land and asset taxes. Eligibility requires that the land not be timbered for the prior two years or for the next twenty years. Pago de Servicios Ambientales (PSAs) are provided in different amounts for reforestation (up to 429 dollars per hectare in 1999 dollars), for forest management (287 dollars), and for forest conservation and natural regeneration (179 dollars). Payments are spread out over a five-year period, with different allocation formulas for each type of forest. With a land title and an accepted management plan, eligible owners may enroll up to 300 hectares (2 hectares are the minimum except for reforestation, which is 1 hectare). Beneficiaries sign contracts covering fifteen years. If they sell within that period, all payments received must be returned unless the new landowner continues the contract. To assist small producers further, experiments have begun with purchasing future timber harvests, thereby providing a steadier flow of income.⁴⁸

Domestic financing of these payments come from various sources, including 40 percent of a timber permit tax that preceded the 1996 law. But more important in recent discussions have been taxes on consumers of natural resources and the services they provide. In 1996 a 15 percent tax on fossil fuels was levied, with one-third of the revenues going to the new forestry financial fund. At the decade's end, establishment of a water tax was a primary political controversy.⁴⁹

But Costa Ricans are not the only beneficiaries of the services provided by its forests. One World Bank study estimated that in the fullest measure of the value of Costa Rican forests, about 70 percent of that value accrues to the global community through carbon sequestration, the existence of biodiversity and option value, and ecotourism (World Bank 1993, 3–6; Kishor and Constantino 1994). Although the world community is far

47. Sources for this section, in addition to our interviews, include Castro and Arias (1998), Castro and Barrantes (1999), and FONAFIFO (n.d.).

48. FUNDACOR, the NGO serving the Area Cordillera Volcánica Central, recently received a World Bank loan to purchase in advance about 20 percent of small producers' potential harvest in the area.

49. In parallel fashion, a few producers also have begun environmental service payments, such as a private utility in the Central Volcanic Conservation Area and a citrus producer (for waste disposal) in the Area Conservación Guanacaste (Janzen 1999).

from paying any such share for these services,⁵⁰ Costa Rica has moved to the front for any payments that might be forthcoming. With the UN Framework Convention on Climate Change of 1992 and the Kyoto Protocol of 1997 initiating the necessary international structures, Costa Rica created in 1996 the Oficina Costaricense de Implementación Conjunta (OCIC). OCIC has the authority to issue carbon bonds (credit tradable offsets, or CTOs), which can then be traded on the international markets that proponents are suggesting will develop. The most notable agreement to date was made with Norway in 1997, which paid 2 million dollars to sequester 200,000 tons of carbon in Costa Rican forests.⁵¹ The following year, the Dutch government received CTOs equivalent to the 673,000 dollars it paid for projects reducing methane emissions. The next year the Dutch put up another 334,000 dollars for carbon fixation.⁵² A joint implementation agreement also has been signed with the United States providing the framework for contracts with private U.S. companies. Perhaps the leading agreement so far has been with Wachovia Timberland Investment Management of Atlanta, which provides offset payments to support Project CARFIX, a program supporting sustainable forestry in the Area de Conservación Cordillera Volcánica Central (Watson et al. 1999, 5).⁵³

At the center of the new environmental services payment system is the Fondo Nacional de Financiamiento Forestal (FONAFIFO), established by the 1996 Ley Forestal to provide financial support for forest conservation to small and medium producers. Administered by a five-person directorate (two appointed by the Oficina Nacional Forestal and three from the public sector), FONAFIFO receives funds from both targeted domestic taxes and international sources, such as through the sale of carbon bonds and access to the country's rich genetic diversity for commercial purposes.⁵⁴ The funds are then allocated to landowners through the structure provided by SINAC, usually via NGOs that work with the constituent conservation areas.

50. For an early justification of such payments, see the final statement of the 1984 Global Possible Conference (Repetto 1985, 502–4); for a more recent discussion, see Dourojeanni (1999). For survey evidence that U.S. citizens might be willing to pay, see Kramer and Sharma (1997).

51. "C.R. to Sell First Carbon Bonds to Norway," *Tico Times*, 26 July 1996, p. 6.

52. "Methane Joins Carbon as Tradable Asset," *Tico Times*, 13 Mar. 1998, p. 8; and "Holland to Finance Local Forest Project," 16 July 1999, p. 4.

53. "'Carbon Sequestration' Project Okayed," *Tico Times*, 3 Mar. 1995, p. 1; see also Watson et al. (1999, 15).

54. Costa Rica emerged as the leader in this area with the establishment of INBio, a domestic NGO operating under agreement with MINAE. In 1999 INBio was operating five interrelated programs: biological inventory of native species, information management (both specimens and an Internet-accessible database), biological prospecting, conservation for development (working with SINAC), and social outreach. INBio is probably best known for its international grants, such as from pharmaceutical multinational corporations in exchange for access to genetic material for drug screening. For further information, see Meyer (1996).

For example, the funds received from both Norway and Wachovia went through FONAFIFO to FUNDECOR, the foundation that serves the Area de Conservación Cordillera Vocánica Central, and then to projects working with landowners on sustainable forestry.

Given the effective institutional arrangements that Costa Rica has developed and its international reputation for environmental leadership, officials there believe that the country has a comparative advantage when a vibrant carbon market develops (e.g., Castro and Arias 1998). Many problems remain, however, before a sustainable harvest of international environmental service payments is received. For instance, in April 1998, Costa Rica became the first country to get CTOs on the market. A year and a half later, there were still no takers.⁵⁵ Any significant sales are unlikely for some time at best, certainly not until the international community agrees on issues such as the deadline for industrialized countries to cut greenhouse gas emissions, whether forest sinks will be allowed as offsets, and if so, what degree of certification international investors will require.⁵⁶

Financial difficulties have also been encountered with the intended sources of domestic funding. Even though the forestry law stipulates that one-third of the fuel tax is to go to FONAFIFO, the Ministerio de Hacienda (Ministry of Finance) has diverted these funds to other uses and even stopped payments at one point in 1998. Furthermore, the head of FONAFIFO under the Rodríguez administration, José Luis Sala, supports the Finance Ministry, at least in public, noting that in a poor country like Costa Rica, the average citizen would support a government decision to use tax monies to battle poverty or to fill potholes over financing environmental services. As a result, FONAFIFO is receiving only about a third of the funds due, leaving the demand for environmental service payments surpassing the available funds. Our interviews found 7,000 hectares of eligible land in 1998 in the Area de Conservación Arenal but only enough funds to make payments for 3,000. In the southeastern zone, the comparable figures were 3,000 and 1,800 hectares. A final major problem is faced by PSA recipients interested in sustainable forestry: one of the two key environmental officials in the Rodríguez administration (the president's nephew Carlos Manuel Rodríguez) recently endorsed the long-standing opposition to such payments by preservationists (domestic and international, such as Greenpeace). Their argument has been that such incentives invariably degrade forests that should instead be off-limits to any economic activity.⁵⁷

The new system has shown important results nonetheless. In 1997,

55. "C.R. Renews Bid to Sell Carbon Bonds," *Tico Times*, 2 July 1999, p. 8.

56. For further discussion, see Kopp and Toman (1998), Parker (1999), and Sedjo et al. (1998).

57. This section draws on our interviews and on a number of articles in the *Tico Times*, including those appearing on 1 July 1998, p. 1; 14 Aug. 1998, p. 14; "Green Tax on Water Debated," 2 Oct. 1998, p. 1; and "Row over Nature Services Bill Continues," 26 Mar. 1999, p. 5.

14 million dollars were paid for environmental services. These payments supported the reforestation of 6,500 hectares, the management of 10,000 hectares of natural forests, and the protection of another 79,000 hectares of forests set aside with no timbering (Castro and Arias 1998, 11).

CONCLUSIONS

Resource endowments, economic structures, and cultural values are interrelated. The absence of a culture of forest stewardship in Costa Rica until recently should be no surprise given that the omnipresent forests were viewed as a barrier to economic activity (agriculture) rather than as a scarce resource of economic value. This situation parallels attitudes when the United States was expanding to the west. Environmental consciousness has been growing among Costa Ricans in recent years, especially in urban areas but in the countryside as well. This cultural change is clearly related to rapid deforestation and the consequent rising value of the remaining forests, materially and normatively. It also stems from considerable efforts made by the country's educational system and NGOs to change Costa Ricans' values, even in remote parts of the country. The expanded state role of the interventionist regime reflected these changing attitudes and their underlying causes, especially runaway deforestation. Some of these policies helped slow the pace of deforestation and buy time for the possibility of further cultural change. We have argued, however, that some of these policies were unenforceable and that the interventionist regime unintentionally contributed to deforestation by undervaluing forests and the goods they produce. Enforcement is related to will, but it is also closely related to capacity. Only so many financial resources are available to the state, especially in poorer countries like Costa Rica. This constraint is especially critical for policy directed toward remote regions where difficult terrain and inadequate infrastructure complicate oversight.

Furthermore, vested interests are sometimes able to turn regulatory approaches to their advantage. The lack of international competition in Costa Rica because of state barriers, for example, allowed the emergence of a plywood monopoly that frequently buys domestic wood below world prices and sells the finished product above world prices. In addition, Plywood Costarricense has been involved in controversial logging close to the flagship national park at Tortuguero, located on the northeastern coast.⁵⁸

The most recent period has provided the opportunity to develop a policy regime that would work more coherently to preserve forest cover by combining effective regulations with market incentives. The challenges facing market reforms in the environmental area, however, might be just as great as with the interventionist approach, given the unique externality

58. *Tico Times*, 27 Feb. 1998, p. 6.

problems of this policy area (Gottfried 1995, 86; Gottfried, Wear, and Lee 1996). Moreover, solutions that allow adequate incomes for all families wishing to maintain rural livelihoods have escaped societies everywhere.

Advocates of a market approach make a strong argument that policy success is unlikely, especially given the enforcement difficulties in the forestry area, unless policy is congruent with the economic self-interest of landholders. If so, forest preservation on private lands requires sufficient economic return for maintaining forest cover. From our field research and the literature, however, it appears unlikely that market-oriented reforms in Costa Rica alone can create sufficient economic value for private forests and their goods and services to protect the appropriate forest cover (see, for example, Kishor and Constantino 1993). The unique opportunity for a country like Costa Rica at this point is to seek solutions stemming from global interdependence. If those living outside Costa Rica are willing to pay an appropriate price for the forest services and goods they receive from other countries, then market incentives have a much better chance as a solution.

Many conservationists worry that Costa Rican forests do not have enough time left to get prices high enough or that it may not even be possible to raise prices high enough. Even with sufficient prices, some also believe that "sustainable forestry" still means "forest degradation." Consequently, strong support remains in the country for state regulation as the proper approach to forest policy. Policy coherence eludes Costa Rica because major contenders disagree over the appropriate means and ends of forest policy as well as its role within the government's broader policies.

Costa Rica's efforts to maintain an adequate forest cover face considerable challenges. But the country remains at the forefront globally in its environmental policy innovations. Even with the conflicts discussed here, the country's pragmatic efforts to integrate state intervention with market-oriented reforms provide a promising model for other countries. Especially notable is how effectively these policy innovations have been combined with the important set of democratizing measures institutionalized through SINAC, which allows for decentralization and popular participation in decision making. The big unanswered question is whether Costa Rica's innovative efforts to secure international payments for the environmental services of its forests will enjoy similar success.

APPENDIX 1 ACRONYMS AND THEIR COMPLETE NAMES

ACLAC	Area de Conservación La Amistad Caribe
ACG	Area de Conservación Guanacaste
AGUADEFOR	Asociación de Guanacaste para el Desarrollo Forestal
APPTA	Asociación de Pequeños Agricultores de Talamanca
ASOCODE	Asociación San Migueleña de Conservación y Desarrollo
ASUNFORT	Asociación Unión Forestal de Talamanca
ATEC	Asociación Talamaqueña de Ecoturismo y Conservación
BOSCOSA	Bosques de la Península de Osa
CAFMA	Certificado de Abono Forestal para Manejo
CATIE	Centro Agronómico Tropical de Investigaciones y Enseñanza
CCB	Certificado para la Conservación del Bosque
CCF	Cámara Costarricense Forestal
CCT	Centro Científico Tropical
CEDARENA	Centro de Derecho Ambiental y de los Recursos Naturales
CODEFORSA	Comisión de Desarrollo Forestal de San Carlos
COSEFORMA	Cooperación en los Sectores Forestal y Maderero
DGF	Dirección General Forestal
DVS	Dirección Vida Silvestre
FONAFIFO	Fondo Nacional de Financiamiento Forestal
FUNDACA	Fundación para el Desarrollo de la Area de Conservación Arenal
FUNDECOR	Fundación para el Desarrollo de la Cordillera Volcánica Central
INBio	Instituto Nacional de Biodiversidad
MAG	Ministerio de Agricultura y Ganadería
MINAE	Ministerio de Ambiente y Energía
MIRENEM	Ministerio de Recursos Naturales, Energía y Minas
OCIC	Oficina Costarricense de Implementación Conjunta
ONF	Oficina Nacional Forestal
PAFT	Plan de Acción Forestal Tropical
PLN	Partido Liberación Nacional
PUSC	Partido Unidad Social Cristiano
PSA	Pago de Servicios Ambientales
REFORMA	Reform for Forest Management
RNRPN	Red Nacional de Reservas Privadas Nacionales
SINAC	Sistema Nacional de Areas de Conservación
SPN	Servicio de Parques Nacional
UICN	Unión Mundial para Conservación de la Naturaleza
USAID	United States Agency for International Development

APPENDIX 2 PERSONS INTERVIEWED, WITH INSTITUTIONAL AFFILIATIONS AT THE TIME OF THE INTERVIEW

Guillermo Arias, DGF, July 1993, August 1995, January 1996
Rodrigo Artavia, CCF, July 1993
Alfonso Barrantes, CODEFORSA, July 1993
Enrique Barrau, USAID, July 1993, January 1995
William Baucom, USAID, July 1991
Amos Bien, RNRPN, November 1995
José Joaquín Campos, BOSCOA and CATIE, July 1991, June, 1992, July 1993
Robert Carlson, Monteverde Reserve, March 1998
Froylan Castañera, FUNDECOR, July 1993
Renzo Céspedes, CCF, September 1995
Carlos Chavarría, Talamanca Biological Corridor, May 1998
Sylvia Chávez, CEDARENA, June 1992
Jack Ewing, ecotourist entrepreneur, Dominical, June 1992, September 1995

Ligia Hernández, UICN, June 1992
 Isauro Herrera, FUNDACA, June 1999
 Ian Hutchison, CATIE, July, 1991, July 1993
 Juan José Jiménez, BOSCOA, July 1991
 Earl Junior, SPN and ACLAC, March 1996, April 1998, 1999
 Ann Lewondowski, USAID, June 1992
 Diego Lynch, ANAI, August 1995, April 1996
 Bob Mack, ANAI, May 1998
 Paula Palmer, anthropologist, Talamanca, June 1992, July 1993
 Héctor Parriagua, BOSCOA, November 1995
 Francisco Ramírez, AGUADEFOR, October 1995
 Emel Rodríguez, AGUADEFOR, July 1993; ACT, March 1998
 Luis Rodríguez, ANAI, numerous occasions through 1999
 Walter Rodríguez, APPTA, numerous occasions through 1999
 José Luis Salas, PAFT; July 1993, November 1995
 Edgar Salazar, CODEFORSA, July 1993
 Mauricio Salazar, ATEC and lodge operator, numerous occasions through 1999
 Carlos Serrano, ASUNFORT, April 1998, June 1999
 Raúl Solórzano, CCT, June, 1990, July 1993
 Karl-Heinz Stoffler, COSEFORMA, October 1995
 Eric Vargas, INBio, February 1998, June 1999
 Olman Varela, Monteverde Conservation League, October 1995
 Guillermo Vargas, Monteverde Conservation League, March 1997, 1998
 Robert Wells, CEDARENA, June 1992

We also interviewed numerous community residents and project personnel throughout Costa Rica whom we prefer to leave anonymous.

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