Diversity

Managing the Amazon Timber Industry

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Timber is a strategic resource in Amazon frontier development, providing 250,000 jobs and up to one-fourth of the region's gross domestic product (Uhl et al. 1997; Veríssimo et al. 2002*a*, 2002*b*). Since the 1980s, timber sales have replaced government subsidies as the main economic force behind frontier expansion, financing roads deep into forest wilderness areas and providing funds to invest in forest clear-cutting and pasture formation (Mattos & Uhl 1994; Nepstad et al. in press). Timber obtained through contracts with individual property owners, large and small, accounts for most of the annual roundwood production. Unfortunately, most of the benefits of these agreements have accrued to loggers rather than landowners, and predatory logging practices have led to forest degradation. If properly managed, however, these accords could significantly reduce the expansion of logging activities into the region's large blocks of sparsely inhabited forests and could provide a strong incentive for landholders to conserve and manage their private forest holdings. But this opportunity will be missed if the new Brazilian government's forest policy proposal concentrates on government-administered timber concessions in an expanding network of publicly owned forests, as proposed by the previous administration (Veríssimo et al. 2002*a*, 2002*b*).

The major government proposal for managing the Brazilian Amazon timber industry and for diminishing the extensive ecological damage it causes (Uhl & Vieira 1989; Nepstad et al. 1999) seeks to isolate the industry from the process of frontier settlement. Amazon timber companies complain that it is difficult to acquire and maintain the large areas of forest needed to implement management systems with 30- to 50-year cycles of timber harvest. The proposed policy seeks to address this problem by expanding the national forest system in the Amazon from 8 to 50 million ha (from 2% to 12% of the Brazilian Amazon), thereby providing the industry with the large blocks of forest it needs (Veríssimo et al. 2002*a*, 2002*b*). Timber companies would compete for government-administered concessions within these national forests, expanding forest concessions from 3200 ha to 20 million ha—a 6000-fold increase—by the year 2010. Brazil's new federal government must now decide if it will pursue this ambitious transformation of the Amazon timber industry.

Although expansion of the national forest system is important for conserving large remaining areas of forest for eventual management and/or conservation, experience throughout the world has shown that governments are notoriously inefficient administrators of forest concession systems (Repetto & Gillis 1988; Barbier et al. 1994; Merry et al. 2003). Typically, concessions have provided opportunities for political leaders to channel favors to their supporters while excluding others—including long-term forest residents—from the benefits of timber production. Brazil appears to represent no exception. The first (and only) timber concession in Brazil, in the Tapajós National Forest (Floresta Nacional do Tapajós) in the eastern Amazon, provided no direct benefits to the more than 20 communities of farmers and caboclos (river dwellers) who have resided in this forest for several decades (Nepstad et al. in press). The proposed forest policy would also draw the timber industry away from the inhabited forests of the Amazon, where logging companies currently obtain most of their timber, into the region's least-disturbed forests, building roads and infrastructure that could catalyze new zones of frontier expansion.

Instead of seeking to isolate logging from frontier settlement, Brazil's Amazon forest policy should focus on the inhabited forests along the region's major highways that are currently the principal sources of wood for the timber industry. From 1996 to 2000, 200,000 families were settled in rural Amazonia (Instituto Nacional de Colonizaçao Rural e Reforma Agrária 2001) onto properties of approximately 100 ha in area, often with insufficient support in infrastructure (roads) and services (schools, justice systems, agricultural extension). The first timber

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cut from these colonist forests (>100,000 km^2) could sustain the timber industry with raw material for several years to come and provide nearly half the managed forest land needed to sustain the industry indefinitely. Through paving of major highways into the core of the Amazon, the forests controlled by small landholders will expand in the coming years, as will the number of species that can be economically harvested (Nepstad et al. 2000, 2001, in press; Carvalho et al. 2001; Lima et al. 2003).

A national forest policy should focus on reinforcing and restructuring the industry's current dependence on privately owned forests, encouraging more equitable distribution of benefits between loggers and landowners. Such a policy could increase the social and economic benefits provided by the industry while diminishing illegal and damaging logging practices. These ambitious policy outcomes will be best achieved through two complementary objectives. First, the large blocks of forest that are loosely controlled by the government and easily exploited by the timber industry should be set aside through expansion of the network of national forests, as currently proposed (Veríssimo et al. 2002*a*, 2002*b*). Large-scale exploitation of these forests should be postponed, however, until experimental concessions implemented on a very small scale demonstrate the desirability (or not) of concession-based timber production in the region. Second, government policy should concentrate on refining and disseminating successful models of timber exploitation and management in privately owned and controlled forests. This effort should focus initially on the numerous settlements (*assentamentos*) in the region, because these are the most rapidly expanding group of forest residents and the population that is most in need of investment in infrastructure and land titling. This approach could also be developed for dissemination among other Amazon populations, such as indigenous groups, agro-extractivists (semisubsistence farmers who supplement their income by harvesting rubber, Brazil nuts, and other nontimber forest products), and cattle ranchers.

Recent innovations in the relationship between logging companies and assentamentos demonstrate the potential for increasing the social benefits of forest exploitation while reducing the ecological damage that it causes (Lima et al. 2003; Nepstad et al. in press). Near Santarém, in the eastern Amazon, a logging company has completed "family forest" contracts with six assentamentos that together hold more than 40,000 ha of forest. The company constructs high-quality dirt roads linking the farm communities to the highway system, demarcates each individual property, and assists participating farmers in acquiring titles to their land. Timber is harvested by reduced-impact techniques (Barreto et al. 1998), and each family receives the fair-market value for the timber harvested from its forest. By the end of each 4-year contract, the farm community gains a government-approved forest-management plan and a durable road network, and each participating family gains a property-level management plan based on a 100% tree inventory, experience in negotiating and monitoring logging operations, and an average income of $1700 from timber sales (equivalent to 3 years of their agricultural income). The logging company, in turn, gains a reliable and legal source of timber that stands up to the inspections of scrupulous buyers.

Within this "family forest" model of forest exploitation and management, the challenge is to provide sufficient incentives to farmers to conserve their forests during the 40-year period between harvests. These incentives are found in the flow of forest-based income from second and third harvests of timber that become profitable as improving transportation networks reduce the production costs of intermediate and low-grade timber species. The increasing consumption and commercialization of nontimber forest products can also provide an incentive for communities to maintain their forests (McGrath et al. in press). But the long-term persistence of healthy forests on private property depends on the integration of forest and agricultural production systems such that forest-based incomes increase while agricultural yields expand on a small portion of the property (Nepstad et al. 2002). One of the most innovative programs for achieving this integration was recently adopted by Brazil's new government as the backbone of its small-landholder agriculture policy for the Amazon (Pereira 2003). The "Proambiente" program will soon provide payments to those farm communities that demonstrate a shift to permanent forms of agriculture and invest in the restoration of forests along streams and on land unsuitable for agriculture. The program compensates farmers for forest conservation and recovery on their land by paying off their government agricultural loans and provides technical assistance promoting a shift from slash-and-burn agriculture to permanent production systems. Without an integrated approach to forest and agricultural production systems such as Proambiente, the temptation will be great for farmers to convert their forests to pastures when commercial timber trees are depleted and a second round of timber harvest is still several years away. These and other obstacles (Muchagata & Neto 2001, Mayers & Vermeulen 2002) require further analysis and experimentation but are small compared to those presented by government-administered timber concessions (Repetto & Gillis 1988; Barbier et al. 1994; Merry et al. 2003). It is more prudent to improve the existing system of timber supply in the Amazon—dominated by informal accords between timber companies and private landholders—than to replace it with a concession system that has worked poorly elsewhere.

Grassroots organizations representing farmers, agro-extractivists, and indigenous groups are poised to rapidly disseminate innovative approaches to negotiations with the timber industry that increase the flow of benefits to local people while avoiding unnecessary damage to their

forests. Properly regulated, such accords could slow deforestation and outmigration to other forest frontiers and encourage forest conservation and management on rural properties. As awareness of the potential benefits of the timber industry to colonists and other forest residents spreads across the region, illegal and unscrupulous logging companies will find it increasingly difficult to acquire timber and to escape reporting their activities to government authorities.

Rather than seeking to avoid the problem of illegal logging on the agricultural frontier by drawing the Amazon timber industry into sparsely populated forests, a new socially oriented Amazon timber policy should be designed. The policy should increase the flow of benefits to communities of forest residents who protect and manage their forests for the production of timber and other forest products, and use the benefits to intensify agricultural production on the 20% of their properties that can be legally cleared for farming. An expanded network of national forests is important to assure the long-term conservation of major tracts of forest. But until adequate systems for regulating timber extraction and forest management in national forests have been thoroughly tested, the focus of Amazon timber policy should be on those inhabited forests that are currently the main source of timber for the industry and also the major focus of social conflict and ecological destruction. It is in these latter areas where the major social and ecological benefits are to be obtained in the short and medium term by developing and disseminating effective models for fostering both small landholder capitalization and the long-term viability of forest protection and management on Amazon farms.

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