

TITLE:**Can privatization conserve the global biodiversity commons? Tropical reforestation through globalization**

AUTHORS: Christian A. Kull (Monash University; presenter at IASCP 2006)
Camellia K. Ibrahim (McGill University)
Thom Meredith (McGill University)

ABSTRACT:

Biodiversity has come to be seen as a sort of global commons in recent decades. Its conservation is promoted for the common good of humanity (and nature) and this logic is used to justify global interventions in local places. This global environmental agenda is arguably part of “globalization”, just as much as liberal economic agendas and booming tourism and migration. This paper investigates the impacts of globalization (the increase in global flows of capital, goods, people, and ideas) on the biodiversity commons, specifically tropical forests. Normally, globalization is blamed for causing tropical deforestation. However, some facets of globalization – the liberal agenda and its drive for privatization, the global conservation agenda, movements of people – may work synergistically to conserve biodiversity in certain places. This paper investigates the impact of these processes on forests in two conservation hot-spots. A case study in southwestern Costa Rica shows how feedback between expatriate investment in real estate, market-driven government environmental policy, a marginalized agricultural sector, and out-migration of farmers is leading to a forest cover turnaround. In Madagascar, however, despite recent legislation facilitating land purchase and private conservation initiatives, important obstacles remain before similar trends could emerge. In conclusion, despite its sometimes problematic implications for social equity, globalization can, in certain cases, lead to biodiversity conservation.

INTRODUCTION

“There is more *briñon* [early-successional forest scrub] now because I abandoned the coffee plantation. There was no one to pick the coffee.”

“There is more *briñon* now because people are going to the US and are selling the farms to Americans.”

“Look at Barú [farm]. Look at how pretty it is. Those that have bought land have planted. They prefer forest to cattle.”

(interviews, three households in Guabo Valley, Costa Rica, 2001-2)

In parts of rural Costa Rica, forest cover is increasing, reversing a half-century trend of rapid deforestation. The causes are complex, as shown through the stories of farmers in the

Guabo Valley, near the Pacific coast.¹ Many of their parents cleared land in the 1950s for cattle and coffee production, encouraged by government subsidies. Now, Sr. Sanchez, for one, has stopped cultivating half his farm, abandoning it to successional scrub. He cannot find enough labor to work the fields – several neighbors have migrated to America; others have more lucrative employment cleaning houses for newly-settled expatriates vacationers and retirees. Besides, the government pays people to plant trees, and Sr. Sanchez’ neighbors received help from a local NGO in claiming a payment. This family is now considering reforesting a further portion of its land, with the intention of selling it.

Sr. Sanchez’ story indicates how globalization impacts forest cover. Globalization is taken to mean the increased interconnectedness of the world and increased international flows of people, capital, goods, and ideas. In some places, such as the Guabo Valley, a convergence of certain facets of globalization is leading to reforestation. This local reversal in forest decline may reflect a ‘forest transition’ (Mather & Needle 1998), that is, a reversal of the historic loss of forest cover. Elsewhere, other facets of globalization continue to fuel deforestation. For example, the global market for tropical hardwoods continues to promote logging, particularly in South East Asia. The processes by which globalization leads to deforestation are well documented and widely disseminated (e.g. Lambin & Geist 2003). The processes by which globalization can lead to reforestation are less well documented (for an exception, see Hecht et al. 2006). These processes are the subject of this paper.

Four facets of globalization are particularly relevant in the past two decades. *First*, the circulation, spread, adoption, and imposition of dominant liberal economic ideas is a key facet of globalization. It is directly associated with 1980s and 1990s shifts in economic philosophies by many nations, and epitomized by the intellectual leadership of the World Bank and International Monetary Fund. Key elements include trade liberalization, privatization of state assets, outsourcing of state services, and opening of markets for a wide variety of goods and services. Liberal policies affect forest conservation in different ways. Some are quite direct, such as the implementation of market-based instruments to encourage forest conservation as a ‘payment for environmental services’ (World Bank 2005). Others, such as the privatization and formal registration of land, have indirect impacts (Deininger 2003).

¹ Based on interviews in 2001-2; Sr. Sanchez is a pseudonym.

Globalization is also about increased flows of people. A *second* relevant facet of globalization is increased out-migration from rural areas. Driven in part by the changing economic structures and agricultural policies of industrializing countries, in part by the condition of global agricultural markets, and in part by falling costs of travel, rural farmers in many countries seek to improve their livelihoods through labor migration to cities and foreign labor markets. Flows from Central America to the U.S., the Caribbean to the U.K., West Africa to France, and India to the Arabian peninsula are indicative of a burgeoning global market for cheap labor and economic opportunity. Impacts on the landscapes and forest cover of sending areas are varied, ranging from field abandonment in Puerto Rico (e.g. Grau et al. 2003) to investment in real estate and consumer goods in Ecuador (Jokish 2002).

Increased flows of people are two directional. Thus, a *third* facet of globalization of relevance to forest change is the phenomenal growth in international tourism. Cross-border tourist visits have grown from circa 25 million in 1950 to over 700 million after 2000, a 6.5% annual rate of increase (WTO 2004). Linked to this growth – and made possible by liberalized economies – is a boom in holiday home purchase and investment in overseas retirement properties, especially in regions valued for environmental and recreational amenities (Williams et al. 2000). For example in Jalisco, Mexico, full-time and seasonal expatriate residents swell the local population from 6,000 to almost 40,000 (Truly 2002). Second-home buyers shift local demographics and spur local economic diversification, which may have indirect impacts on forest cover. Their presence may also result in direct impacts on land cover through tree planting or private conservation efforts.

A *fourth* aspect of globalization is the global environmental agenda set by the Brundtland Commission, decadal United Nations conferences, and powerful organizations like the World Conservation Union (IUCN) and the World Wide Fund for Nature (WWF). This agenda of sustainable development and biodiversity conservation has been internalized by many tropical governments, and has increased the numbers of state, NGO, and private actors working towards conservation goals in the field. The result is that tropical forests are no longer just the domain of state forest bureaucracies or marginalized swidden farmers. Now, environment ministries, bilateral aid agencies, UN agencies, international conservation organizations, university scientists, national and local NGOs, and local governments all aim to influence forest change.

The convergence of these four facets of globalization is particularly likely in areas of high scenic or biodiversity value, particularly where commercial agriculture is marginal. We investigate the manifestation of these facets of globalization in Costa Rica and Madagascar, two developing countries where forest conservation has been an important concern due to high levels of biological diversity – and thus concern for the ‘global commons’ of biodiversity (Goodman & Benstead 2003; Janzen 1983). Both countries suffered serious levels of forest loss during the 20th century – in part at the hands of global forces like colonial timber extraction (Jarosz 1996) or investment in cattle-export markets (Hall et al. 2000), and in part due to local demand for land. Our intention is to associate the facets of globalization with general condition in each country, and then to conduct two comparisons: one is to look at a local setting in Costa Rica to determine how these process have operated in practice; the other is to look at Madagascar to determine whether, and if so, how, the process have operated in another political, cultural and ecological setting. We find that local variations in the impacts of globalization – due in particular to location, political history, and social context – lead to different outcomes. While a forest transition is evident in parts of Costa Rica, the same factors look unlikely to cause a similar turnaround in Madagascar in the near future.

GLOBALIZATION AND THE TROPICAL FOREST TRANSITION

Over the past century, much attention has been devoted to the loss of tropical forests to other uses (Babin 2004; Lambin & Geist 2003). As a result, it is no surprise that recent isolated findings of tropical forest expansion have attracted attention. The expansion of forests on the island of Puerto Rico over the past three decades is particularly well documented (Aide et al. 1995; Grau et al. 2003; Rudel et al. 2000). Researchers have also documented forest expansion in the West African forest-savanna transition zone (Fairhead & Leach 1996); in India (Foster & Rosenzweig 2003); in the highlands of Mexico and Central America (Hecht 2004; Hecht et al. 2006; Klooster 2003; Simmons et al. 2002; Southworth & Tucker 2001), in the Dominican Republic (Rivera et al. 2000), and in the Amazon basin (Perz & Skole 2003; Rudel et al. 2002).

These findings point to an incipient tropical forest transition. A ‘forest transition’, as defined in a widely-used theoretical model of forest change, occurs due to the impact of economic modernization on forest cover (Mather and Needle 1998; Rudel 1998; Rudel et al.

2005). This model posits that during an initial period of development and demographic expansion, increasing numbers of farmers clear land for agricultural expansion and extract timber for fuel and construction material. As a result, forest cover declines. Later, a more modern, industrial economy develops. Urban opportunities, combined with agricultural intensification, lead farmers to abandon marginal lands, which, together with an increase in demand for forest products and services and forest-promoting state policies, leads to a ‘turnaround’ in forest cover. Such forest transitions are widely documented during the 19th and 20th century in Europe and North America (Foster et al. 1998; Mather et al. 1999; Rudel & Fu 1996).

More recent commentators agree with Rudel et al. (2002, 89) that tropical forest transitions arise out of an “ensemble of activities” that are often quite particular to regional and local contexts. That is, the broad trends of industrialization, rural depopulation, demand for wood, or farmer agency in seeking livelihoods are all shaped by the particular ecologies, politics, and economics of specific places. Forest transitions depend on economic forces at scales ranging from the local to the global. They depend on the rules shaping tree cutting and planting – from formal land tenure and forestry laws to informal community institutions. They depend on policies and their place-specific impacts – such as road building schemes or regional development initiatives. They depend on availability of markets and farm labor, trends in commodity prices, and patterns of labor migration. And finally, they depend on the character of the biophysical environment, such as forest patch size, soil character, or seed dispersal mechanisms (Foster & Rosenzweig 2003; Grainger 1995; Klooster 2003; Moran et al. 2000; Rudel et al. 2005; Simmons et al. 2002).

Despite its usefulness, forest transition theory harbors some challenges. For one, there is a tendency to focus on a uniform category of ‘forests’, ignoring the fact that natural regeneration, farmer agro-forests, or plantation woodlots each have different implications for economic use, vegetation structures, species diversity, and carbon sequestration. In addition, the theory’s focus on long-term forest change glosses over short- or medium-term fluctuations in forest-cover (Perz & Skole 2003). Finally, it is misleading to assume a state of stability after a forest transition; forest cover can wax and wane (Mather et al. 1999).

We focus here on another critique of forest transition theory. We question the reliance of much of the forest transition literature on ‘modernization’ as the central driving force.

Modernization, in this sense, refers to a model of economic and social change shaped on the historical experiences of industrialized countries (Rostow 1960). For example, Rudel et al. (2005) posit two major categories of forest transition: the ‘economic development path,’ in which labor demand changes such that agriculture in marginal (potentially forested) areas is no longer viable, and the ‘forest scarcity path,’ in which demand for forest products and services causes forest to be protected, restored or planted.

These accounts partly describe what Sr. Sanchez has experienced, but they overlook several of the processes affecting him, such as expatriate tourism and investments, global environmental interventionism, and liberal policies facilitating global property markets. These processes are all facets of globalization. While straightforward modernization may continue to drive forest change in some places, other places are more exposed to the effects of globalization. Rudel et al. stress the importance of forest transition analyses as foundation for policy formulation and note that understanding the process may allow governments to speed forest recovery. This presumes that the analyses are accurate and that all of the correlates of forest transition are socially desirable. These presumptions need to be examined. By conceptualizing globalization as a key driver of forest change in recent decades, theories of forest transitions can be made more contemporary and comprehensive and may better account for some of the variations in forest patterns observed in different places and may better identify desirable or undesirable correlates or externalities.

In the following sections, we investigate the impacts of globalization – notably the four facets described above – on recent forest cover trajectories in Costa Rica and Madagascar. The hypothesis is that in certain places – particularly those of scenic and biodiversity amenity – these four elements of globalization can drive increases in forest cover, but at some social cost.

FOREST CHANGE IN COSTA RICA

Starting in 1950 and continuing through the mid 1980s, Costa Rica’s annual deforestation rate accelerated to almost 4% per year, one of the highest in the world (de Camino et al. 2000; Kleinn et al. 2002). While published forest cover figures vary widely, a consensus view points to an overall decline from circa 60% cover in 1960 to circa 30% in the 1980s (Kleinn et al. 2002). Concerned scientists pointed out that this rapid deforestation would not only threaten the

country's fabled biodiversity, but also lead to timber shortages, areas of severe soil erosion, complications for watershed protection, and increasing pressures on protected areas (Hall et al. 2000; PROCIG 2001; Thacher et al. 1997)

This rapid deforestation was rooted in international markets and domestic government policies. In the 1960s, substantial areas were cleared for sugar and banana cultivation in response to increased American demand. Later, cattle ranching was encouraged by government credit and subsidy incentives, based on optimistic assumptions of increasing U.S. demand for beef (de Camino et al. 2000; Kaimowitz 1996). The government gave land rights to squatters for 'improvements' such as cutting forest and maintaining a minimum number of cattle (Brockett & Gottfried 2002). Between 1979 and 1992, 23,000 ha of natural forest were converted to pasture annually (de Camino et al. 2000), to the point that by the mid-1990s cattle grazed on 44 percent of Costa Rica's total land area (Hall et al. 2000).

Around 1990, the downward trend of national forest cover flattens out (Kleinn et al. 2002). Some forest cover figures published for subsequent years are approximately 15% higher (Kleinn et al. 2002), reflecting the fact that in some regions, forest cover has been increasing (Brockett & Gottfried 2002; de Camino et al. 2000; Snider et al. 2003; Stem et al. 2003). This forest regeneration has been driven by a number of social, economic, and policy drivers. Below we investigate these drivers in terms of the four facets of globalization.

1 – Liberal economics

In a pattern common across the globe, Costa Rica's national policies moved towards economic liberalism beginning in the 1980s. Struck by a debt crisis in 1981, Costa Rica defaulted on its foreign loans. Pushed by International Monetary Fund structural adjustment programs and World Bank lending policies, over the following two decades the government reduced trade barriers, eliminated crop price supports, ended consumer subsidies for basic grains, privatized state assets, and increased the possibilities for private-sector involvement (Edelman 1999). These reforms affect forest cover in important but indirect ways. They deeply impacted agriculture, triggering some of the rural out-migration described below. The reforms also shifted approaches to environmental management, through the increased adoption of market-based tools, also described below.

2 – *Out-migration*

Rural Costa Ricans are increasingly migrating elsewhere in search of livelihoods. At the root of this process are profound changes in the structure of the rural agricultural economy over recent decades. The welfare state of the 1950s-1970s – with agricultural credit programs, price subsidies, and cooperatives – was dismantled following the liberal economic reforms of the 1980s and 1990s. Government policy refocused on export-oriented, non-traditional and high-value crops while phasing out incentives for land clearing for beef farming. The manufacturing sector grew. By the early 1990s, the number of people working in agriculture had dropped and areas under agricultural production and pasture declined. Basic grain production fell, food imports increased, production costs rose, and exports such as coffee and beef as well as some of the new non-traditional crops suffered a series of destabilizing fluctuations (Sick 1997; Edelman 1999).

To ensure economic security, households often diversified their livelihood portfolios to include wage labor and micro-enterprises, and increasingly turned to migration and remittances (Schelhas & Sánchez-Azofeifa *in press*; Sick 1997). Costa Rica received over \$US 329 million in worker's remittances in 2004, much of it from the United States where at least 70,000 native-born Costa Ricans live.² If Costa Rica is anything like El Salvador, areas receiving more remittances will correlate with zones of forest expansion (Hecht et al. 2006).

3 – *Tourism*

While rural Costa Ricans leave, tourists and expatriate land-buyers arrive. Tourism grew steadily from the early 1960s (e.g. 49,000 in 1962) to the mid-1970s, reaching a plateau of circa 300,000 visits a year. Tourism boomed again from the late 1980s, and arrivals increased to over 1.1 million by 2001 (Europa 1964-90; WTO 2004). By 1993 tourism had surpassed both coffee and bananas as the most important source of foreign exchange (Campbell 2002). Associated with the growth in tourism is a boom in foreign investment in property. At least 20,000 –

² World Development Indicators Online (www.worldbank.org, last accessed Dec. 9, 2005) and US Census Bureau Census 2000 Special Tabulations (www.census.gov, last accessed Dec. 9, 2005)

perhaps up to 50,000 – Americans live in the country, including many retirees.³ Costa Rica even recognizes ‘retirees’ as a category for immigrant visas.

4 – Global environmentalism

A fourth key trend shaping forest cover in Costa Rica has been a growing interest in forest conservation, influenced by the global environmental agenda (Steinberg 2001). A general rise in environmentalism within the Costa Rican population echoed the growing international concern over tropical deforestation. Earlier attitudes that equated land clearing with ‘improvement’ started to give way to valuing forest cover as a patrimonial heritage and biodiversity as economically profitable vis-à-vis the tourism and pharmaceutical industries (Brockett and Gottfried 2002; Campbell 2002; Snider et al. 2003; Vivanco 2001). Foreign players, however, continue to play a key role in environmental actions. Foreign environmental NGOs and bilateral aid donors fund and implement conservation projects together with their Costa Rican counterparts; scientists lobby locally and abroad for action; and tourists spur an entire industry devoted to images of pristine nature. As an example, eight new protected areas were established directly through the lobbying of foreign organizations or individual expatriates (Campbell 2002; de Camino 2000; Langholz et al. 2000; Thrupp 1990).

Growing domestic and international environmental interests also pushed a variety of policies promoting reforestation and forest conservation on private lands. As early as 1979, in recognition of the extent and rapidity of deforestation, the government directed tax subsidies to large landowners for reforestation. This evolved into incentive programs targeting smaller farmers that provided funds before planting in order to cover costs. 140,000 ha of land were enrolled between 1979 and 1997, but participation was often low and long-term results uncertain (Thacher et al. 1997; de Camino et al. 2000).

In the mid-1990s, these policies were reshaped in accordance with liberal economic ideas, pushed in part by the third World Bank structural adjustment plan. Forest policy – encoded in the 1996 Forestry Law – shifted to an innovative market-based program that compensates landowners with forested property for environmental services including reducing greenhouse gas emissions, protecting watersheds, conserving biodiversity, and scenic beauty.

³ Figures from U.S. Dept. of State Background Note on Costa Rica (www.state.gov, last accessed Dec. 9, 2005) and from www.shelteroffshore.com (last accessed Dec. 9, 2005). There are also important expatriate communities from Canada, the rest of Latin America, and Europe.

For example, under this policy framework, landowners sign a contract ranging from 5 to 20 years with the government, agreeing to either protect forest-cover or engage in reforestation. Funding for this program comes from a variety of sources including a 5% fossil fuel tax, private sector and foreign donor contributions, and the sale of carbon offsets to industrialized countries. By 2001 5.5% of the national territory was receiving payments for environmental services, with over 4,400 participants. Demand has consistently out-stripped available funds, and the Global Environment Facility-funded Ecomarkets project was launched to help cover payments, strengthen the capacity of NGOs to manage local aspects of the program, and target priority biological corridors (Brockett & Gottfried 2002; de Camino et al. 2000; Snider et al. 2003; Zbinden & Lee 2005).

Another forest conservation initiative shaped by global environmental and liberal ideas is the government's recognition of conservation easements and private nature reserves. Under the 1992 Private Wildlife Refuge Program, landowners who adhere to a government-approved conservation management plan receive a bundle of incentives including exemptions from property taxes, access to technical assistance, and government recognition. Landowners are required to enroll for extendible periods of 10 years and are subject to monitoring to ensure continued forest conservation. Currently, the government recognizes 58 private reserves covering 3.53% of the national territory, not including a number of non-registered reserves. According to Langholz et al. (2000), private reserve owners tend to be large landholders who see registration in the program as a way to protect their property from local municipality development agendas and to gain government assistance in evicting squatters.

*The Guabo Valley*⁴

The complex synergies between the four key facets of globalization appear to have slowed Costa Rica's rampant deforestation. Below, we illustrate how globalization impacts forest cover in a small region near the southern Pacific coast. We show that expatriates purchasing land, together with environmentalists pursuing conservation agendas, encourage forest re-growth in a political and economic context where local *campesinos* are abandoning their pastures and fields.

⁴ Research, conducted in 2001-3, was based on interviews with the 45 Costa Rican households permanently residing in the area, with local NGOs, with absentee landowners, with expatriate residents, and with real estate agents.

The Guabo River valley, located between the Coastal and Tinamastes mountain ranges in southwestern Costa Rica (Figure 1), was settled and deforested beginning in the 1940s. Settlers pushed into this steep-sloped lowland humid tropical region, encouraged by government policies to relieve population pressures elsewhere and promote coffee production (interviews 2001-2; Sandner 1962; Sick 1997). In addition to coffee, colonists mainly cultivated maize, beans, and rice. Forest cover declined as cultivation increased; deforestation accelerated with incentives to expand cattle ranching beginning in the 1960s.

Today, patches of old-growth seasonal tropical moist lowland forest are concentrated on the steepest slopes and in ravines, crop fields and pasture occupy large areas, while patches of scrub and secondary forest cover some abandoned fields. Forest cover change in the Guabo Valley over recent decades is demonstrated by aerial photos of a 44.5 km² zone (Figure 2). Large, connected forest patches visible in the 1973 image become smaller and increasingly fragmented by 1992 image, due to a substantial growth in pasture. During this period, the area under forest-cover declined, from 30.2 km² to 27 km². From 1992 to 1997, however, a re-growth of both scrub and taller tree stands is visible. In just five years, rapidly re-growing forest cover⁵ returned to 29.8km², a 10.4 percent increase on 1992.

What drives this turnaround in forest cover? To begin with, the changing agricultural economy is no longer a viable livelihood for many local *campesinos* (farmers). The valley is agriculturally marginal due to the steep topography and poor road infrastructure (PROCIG 2001); local land degradation and the liberalization of government agricultural policy present additional constraints. *Campesinos* convey the general feeling of marginalization:

“It costs to sell beans. It costs to sell maize. The prices are very low. It is cheaper to buy beans in the store than to grow them and try to sell them yourself.”

“Our government has opted for free market trade. Our crops come out very expensive. Therefore, the government prefers to import from other countries. The *campesino* is thrown away.”

(interviews, 2001)

As a result, some *campesinos*, particularly wealthier landowners further from the coast, have focused on cattle production. This trend has led to some forest thinning in the northern part of

⁵ Such fast re-growth seems remarkable. However, tree growth rates measured on local abandoned pastures range from 1.2 to 3.1 meters per year; some trees exceeded 10 cm diameter in 5 years (Leopold et al. 2001).

the study zone, but appears to support the abandonment of farms on other land: “People here work as *peones* [day laborers] on cattle ranches; those people can afford to leave some of their own land forested” (interview, 2001).

Other *campesinos* diversify their income sources into off-farm activities. 85% of households reported working less on their own farms than in the past. Nearly half had at least one member working as day laborer on other farms. Others work as domestic servants or caretakers on expatriate properties, construction workers, or in retail and hotels along the coast. Four out of every five households had at least two family members with salaried off-farm or non-farm jobs, and most linked these opportunities to an influx of foreigners and the tourism industry. Migration is further strategy. About one-quarter of households interviewed had family members working in the U.S., and remittances form important income for those who remain. Some leave permanently – at least 35 families were reported to have permanently left the valley between 1992 and 2002.

Campesinos abandon fields due to a lack of labor or more attractive alternative activities, and forest re-grows quickly in the humid tropical environment. The growth in tree cover is significantly aided by the growth of tourism-related property investment and by increased environmental activity. Indeed, increases in tree cover as shown in aerial photographs are notably concentrated in areas where foreigners have purchased land and environmental NGOs have become active. Expatriate land purchases are concentrated around the nearby tourist beach town of Dominical, but have moved inland since the early 1990s. Affordable land prices as well as proximity to the beach make the area attractive. Fifteen real estate companies have offices in Dominical. Properties sold range from building sites of less than 1 ha to farms of over 400 ha. Between 1992 and 2003, an estimated 76 foreigners purchased land in Lagunas, Platanillo, and along the road to San Juan de Dios (Figure 1; South Coast Realty, pers. comm., 2003). Purchasers are predominantly foreign nationals – representing the U.S., Canada, Europe, and a number of Latin American countries.

Many expatriate property investors report a desire to purchase a piece of ‘tropical paradise’. Real estate companies actively market this idyllic lifestyle image, advertising attributes such as ocean and rainforest views, private waterfalls, Costa Rica’s reputation as a peaceful country, and easy access to urban centers. This message is often mixed with a conservation-oriented narrative. One new arrival in Lagunas stated that she came here to “do

something – to help nature and not sit in the States and give donations to the Nature Conservancy” (interview 2001). Properties purchased for residential or holiday purposes are typically re-vegetated to fit the owners’ perceptions of a Costa Rican ‘jungle’ landscape. The steepest sections are planted for erosion control and allowed to revert to forest. Around the house itself, the owners plant ornamentals and native fruiting trees to attract local wildlife and birds. Locals know of these expectations, and as a result, some deliberately fallow their land (ASANA & TNC 2000; c.f. Brockett & Gottfried 2002).

Land in the Guabo Valley proper is less attractive to the majority of foreign buyers because the area lacks infrastructure and easy access to (or views of) the beach. However, the modest increase in land-sale in the valley to foreigners wanting to live ‘off the beaten track,’ or particularly interested in forest conservation, has resulted in pockets of forest-cover expansion. Of seven landholdings purchased by foreigners in the valley by August 2001, forest cover has increased on all but one, a cattle ranch. The other properties are an eco-tourism development, a cattle farm with two-thirds abandoned to forest, three large private vacation properties, and a research and conservation site for a non-profit environmental organization, Tropical Forestry Initiative (TFI).

Conservation-oriented NGOs like TFI play a key role in implementing a global conservation agenda at the local level. Established in 1992, TFI was formed by several North American academics and professionals. TFI runs a native tree nursery, researches forest succession on abandoned pastureland, and supervises reforestation on numerous properties – most owned by expatriates (Leopold et al. 2001). A second environmental NGO active in the region is ASANA (*La Asociación de Amigos de la Naturaleza del Pacífico Central y Sur*). Founded in 1987 by local Costa Rican residents, ASANA is very active in a variety of environmental agendas. With funding from both national and international sources, including the Nature Conservancy and the GEF-funded Ecomarkets project, ASANA promotes a biological corridor approach to conservation. Specific projects help communities with local environmental problems, facilitate registration of forested properties in the government-sponsored payments for environmental services program, and aid property owners in the establishment of private reserves and conservation easements (ASANA & TNC 2000; interviews 2001, 2003). This local manifestation of the global environmental agenda is a significant factor in driving land use decisions and forest cover change.

The Guabo Valley is experiencing a forest transition, driven by a marginal agricultural economy, the influx of expatriates, and the presence of environmental NGOs working to promote forest conservation. Superficially, this fits with forest transition models based in economic modernization, yet it is clearly comprehensible only with reference to idiosyncratic conditions and to contemporary forces of globalization. Yet, while globalization as manifested in this region may increase tree cover, it would be inappropriate for policy makers to uncritically assume that the driving forces should be reinforced or generalized to speed forest transitions. In fact, with the possible exception of the local application of the global environmental agenda, it is difficult to see that any of the driving forces come without negative externalities that should be very carefully considered. *Campesinos* are becoming marginalized as a group and outsiders are taking both their land and their places as the decision-makers most influential in shaping patterns of land-use; new environmental problems are emerging related to road and house construction, including localized erosion and river pollution.

FOREST CHANGE IN MADAGASCAR

The loss of the Madagascar's rainforests, located along the eastern escarpment of the island, has caught the attention of observers for over a century (Goodman & Benstead 2003; Kull 2000). By the mid-1980s, two-thirds of the 'original' eastern rainforest had been cut (Green & Sussman 1990). The chief causes include colonial era logging and expanding short-fallow subsistence-oriented shifting cultivation (Aubert et al. 2003; Jarosz 1996). The island's drier forests, found in the west, have seen less dramatic changes, though the rapid expansion of maize cultivation for domestic and overseas markets has periodically threatened southwestern forests (Blanc-Pamard et al. 2005; Seddon et al. 2000). Below, following our analytical framework, we investigate the impacts of the four facets of globalization on forest cover. While most facets of globalization in Madagascar are similar to Costa Rica, the practical outcomes are quite different.

1 – Liberal economics

Madagascar defaulted on its foreign loans in 1980 and came under the tutelage of the Bretton Woods institutions, thus beginning a program of economic liberalization. However, while the items on the policy agenda reflect the Costa Rican experience – currency devaluation,

government austerity, reduced food subsidies, lowered trade barriers, privatization of state monopolies – Madagascar differed both in its starting point (a much more socialist, dirigiste model) and its pace of reform (very partial and gradual). Reforms suffered numerous setbacks, due to political instability, droughts, and conflicting political agendas (Barrett 1994; EIU 2004).

The pace of liberal reforms changed in 2002, when Marc Ravalomanana, a self-made business tycoon, wrestled control from long-time President Didier Ratsiraka. This placed the country in the hands of a President favorable to the global liberal agenda; key policies boosted by his presence include the privatization of parastatals, export processing zones, and fuel liberalization (EIU 2004; Marcus 2004). Two additional liberal reforms stand out in their potential relevance to forest change of the type noted in Costa Rica, one related to expatriate land purchases (discussed under tourism) and one to economic incentives for conservation (treated under global environmentalism).

2- Migration

In sharp contrast with Costa Rica's *campesinos*, most Malagasy farmers (*tantsaha*) are not beginning to abandon fields in marginal regions. Indeed, the rush to cultivate new land is still driving current deforestation (Kistler et al. 2001), and is reshaping grassland regions into cultivated zones (Kull 2005). The liberalization of agricultural marketing has not pushed radical changes in rural farming strategies, as two-thirds of household production is used, on average, for subsistence purposes (Barrett 1997). The alternative livelihood options seen in the Guabo Valley – especially employment in expatriate-related activities – are extremely rare in Madagascar. Migration is important, yet has not yet led to rural depopulation. *Tantsaha* have long migrated seasonally or permanently on the island to seek new lands or urban employment (Aubert et al. 2003; Raison 1984). Overseas migration – chiefly to France and Réunion – is significant, with recent estimates of a diaspora population of about 50,000. However, these migrants are largely students and professionals, not *tantsaha* (Crenn 1998).

3 – Tourism

During the early years of Ratsiraka's rule, from late 1970s into the 1980s, Madagascar was effectively closed to Westerners. As the country slowly re-opened its doors to the outside world, tourism began to flourish (despite disruptions due to political instability in 1992 and

2002). In the 1990s, the island gained a reputation as an exotic eco-tourism and beach destination. While recent growth has been high, numbers remain small compared to neighboring Mauritius and Kenya or, for that matter, compared to Costa Rica: visitor arrivals grew from 6000 in 1968, to 9000 in 1977, to 50,000 in 1990, to 230,000 in 2004 (Europa 1968-90; WTO 2004). Key sending countries include metropolitan France (52%), nearby Réunion (10%), and other western European countries (18%) (EIU 2004). The presence of increasing numbers of foreigners in the country – including tourists, researchers, business and tourism investors, development volunteers, missionaries, university students and interns – builds the networks and activities connecting the island more and more to global trends.

Land acquisition for expatriates is difficult, though Ravalomanana seeks to modernize and liberalize land tenure arrangements. Currently, much of the country is under customary tenure arrangements, without deeds, titles, or cadastres. Formal, modern, state-sanctioned private land tenure covers only relatively small areas in cities, certain surveyed areas (Raison 1969), and on farm concessions. Following the liberal logic, Ravalomanana is supporting a push for modernization of the land tenure regime, by facilitating and streamlining the paperwork involved in gaining state-sanctioned private land title. An element of this push is a 2003 law that reverses prohibitions on land purchases by foreigners.⁶ The 2003 law re-authorizes foreign ownership, but subject to rather restrictive terms: each purchase must include an investment program of at least USD \$500,000; lot sizes are limited to 2.5 hectares⁷; and the government reserves the right to revoke the title should the investment program not be executed. To date, it has only been used in a few cases, despite significant marketing by government agencies (e.g. www.guide.gouv.mg).

4 – Global environmentalism

Outsiders repeatedly voiced concern over forest loss over the last century. Botanist Henri Humbert, for example, pushed the French colonial government to set up a dozen ‘strict nature reserves’ in remote areas in 1927. Global involvement in conservation on the island has boomed

⁶ With precedents in the laws of the pre-colonial Merina monarchy, the country banned foreign ownership in the 1970s as part of efforts to shake off the lingering shackles of colonial domination. The new law is *Loi* 2003-028, with accompanying legislation *Loi* 2003-027, *Loi* 2003-029, and *Décret* 2003-879. Long-term leases of up to 99 years to foreigners have always been possible, but not frequently allocated.

⁷ This limit applies to the tourism sector; lower limits are set for the financial sector (1 ha) and the real estate sector (1.5 ha).

significantly in the past 20 years. The country is currently in the third phase of a multi-million dollar Environmental Action Plan signed into law in 1990 and funded by foreign donors including the World Bank, U.S., French, and German bilateral aid, and conservation NGOs like WWF (Goodman & Benstead 2003; Kull 1996). Foreign actors play a central role – for example, an American primatologist was the key force behind the 1991 creation of Ranomafana National Park.

As illustrated by the recent Disney movie *Madagascar*, the island enjoys a reputation of remote and unique natural splendor, not unlike the reputation of Costa Rica. As a result, environmental actors – from international NGOs to government agencies to bilateral donors to local associations – occupy a prominent position in the nation’s political and social life (Gezon 2000; Simsik 2002). In such circumstances, recent governments have typically strongly supported environmental agendas. At the 2003 Parks Congress in Durban, for example, President Ravalomanana announced an ambitious plan to expand the protected areas network from 2.9% to 10% of the national territory in just five years.

A recent reform – the legalization of private nature reserves, or *aires protégées volontaires* (APV) – reflects the meeting of global environmentalism with liberal economic ideas (Nielsen & Rice 2004). The Protected Areas Management Code, signed into law on August 7, 2002, makes way for the establishment of APVs belonging to public bodies (like provinces or rural municipalities) or private individuals.⁸ The Code stipulates that owners may apply for their territory to be officially recognized as an APV in order to protect natural or cultural sites of interest. In exchange for submitting to technical management advice from the government, the owner receives the legitimacy and publicity of government recognition and an “an apprenticeship in rational management techniques” (Edmond 2003: 3). APVs are now being proposed or established in different contexts around the island. For example, the World Bank suggests that the local community and tourism operators use this approach for the protection of Nosy Tanikely, a small islet and reef near the tourist centre of Nosy Be (GoM 2005). Similarly, the Malagasy environmental NGO SAGE proposes to enroll a number of the projects it oversees – forests and lakes managed under the country’s 1996 community-based natural resource management legislation – into the APV network.

⁸ Articles 71 to 74 of *Loi* 2001-05.

The result – a forest transition?

Clearly, the four facets of globalization we have discussed affect Madagascar as they affect Costa Rica. However, the consequences are very different. Crucial differences in the geography and historical path of the nation, and in the on-the-ground manifestations of globalization, have so far not lead to a forest turnaround. National scale statistics of forest cover continue to document losses (Goodman & Benstead 2003), and any local impact is limited to extremely dispersed ‘islands’ of conservation.

Tree cover *is* growing in some cases, such as the central highlands. Most of this growth consists of exotic pines, eucalypts, and wattles, as well as shade, ornamental, and fruit trees around settlements. This growth is due to two chief factors: government efforts to ‘reforest’ the grassland region through state-owned plantations, land tenure incentives, and labor coercion; and *tantsaha* efforts to profit from the burgeoning wood fuel demand of the cities (Bertrand 2004; Kull 2005). This growth, however, is hardly attributable to globalization.

Madagascar’s deep poverty and subsistence-based rural population, its lower volume of tourism, and slower liberal reforms do not allow for the same kind of processes as in Costa Rica. Furthermore, there are a number of specific obstacles to the expatriate-property purchase pathway to a forest turnaround. *First*, land buying remains fraught with difficulty, stemming from the uncomfortable overlap of community-based tenure systems and state-based property registration, and the weak and corruptible state judicial and police system. Buyers of land will want guarantees that there will not be protracted conflict. *Second*, the legislation allowing foreign property purchase precludes – through its investment minimum – the kind of middle-class second home purchase found in Costa Rica as well as the small to medium sized eco-tourism operators. People find a way around these rules – through partnerships with Malagasy citizens, or through leases – but this limits the extent of the activity. *Third*, the legislated restrictions on lot size largely eliminate the value of the law to international conservation NGOs with a mandate to purchase lands, such as the Nature Conservancy. *Fourth*, Madagascar is more remote from potential buyers (largely in Europe) than Costa Rica is from North America.

In the future, however, could globalization through liberal reform, foreign investment, rural economic shifts, and conservation initiatives contribute to a forest turnaround in Madagascar? Actors in Madagascar are finding and testing alternative approaches that may lead to similar pro-forest outcomes as in Costa Rica. For example, the Forest Service, which on paper

controls most of the significant remaining blocks of unprotected forests, has begun leasing out certain bits to ecotourism operators. The plantation pine forests of Antsampandrano (north of Antsirabe) and the mixed natural forest and pine/eucalyptus plantations of the Ialatsara (north of Fianarantsoa) are now managed by expatriate concessionaires whose core business relies on maintaining forest cover. Another example is investments in ecotourism facilities adjacent to existing protected areas – such as the Vakona Forest Lodge near Mantadia National Park – that lead to further protection of land outside the formal protected areas.

Foreigners and urban elites are also promoting forest conservation by facilitating the establishment of APVs in dispersed locations. This facilitation is both direct, by means of funding, technical advice, encouragement, and networking, as well as indirect, by providing ideas and incentives through promotion of both conservation discourses and ecotourism economies. A key successful example is the Alan' Anjà community protected area just south of Ambalavao. This site at the base of a spectacular 1000 m granite cliff features a small natural forest, huge boulder piles, caves, and burial sites. It is just off a main road, so tourist visits now number in the thousands each year, earning the community association that manages the site more than USD 10,000 per year (Rabetaliana 2002).

International conservation organizations are searching for additional ways to conserve forests that circumvent direct ownership issues. Conservation International's proposals for 'conservation incentive agreements' (Niesten & Rice 2004) – which grew out of earlier conservation easement approaches used in the United States – aim to provide a vehicle for paying land managers to leave natural habitats intact. While this approach has not yet been implemented in Madagascar, it is being actively discussed among foreign NGOs.⁹

CONCLUSION

Globalization – manifested locally through specific processes like expatriate real estate investment and rural agricultural marginalization – has led to an apparent forest transition in some parts of Costa Rica. In the historically and geographically different context of Madagascar, the same processes have not yet stopped rampant deforestation, not even in key ecotourism destinations. The Costa Rican case shows the importance of the coming together of a

⁹ Paul Ferraro and Dick Rice, pers. communications, 2005

‘constellation’ of actors and circumstances to allowing a forest transition to occur. Contributing factors include a liberal economic and property environment; state support of conservation incentive programs; environmental NGO lobbying, funding, and projects; geographical location and amenities; and, quite crucially, rural socio-economic changes linked to evolving agricultural markets, out-migration, and livelihood diversification. In Madagascar, some similar conditions exist, particularly with respect to environmental NGO action, a national discourse of concern for environmental degradation, and attendant state support of conservation action. A real property market, however, does not exist, despite recent legislation.

‘Globalization’ manifests itself in multiple ways, and despite its homogenizing momentum, it has diverse practical consequences. Forest re-growth can be one of them. But this finding – that globalization can be ‘good’ for the environment – does not mean that the four key globalization facets we have explored – liberalizing economies, increased labor mobility, increased tourism and global environmentalism – are without other consequences. The bitter pill of liberal economic reform has impoverished many people. Poor migrants trading places with wealthy expatriates has a cruel irony that not lost on those involved, just as global tourism has its own legacy of economic displacement and cultural damage. Finally, the global conservation movement is still wrestling with issues of dispossessing marginal people. These arguments show that forest transitions must be also seen as a local and personal phenomenon, not just a remotely sensed ‘conservation success story’ and not certainly not just as a statistical transition. The evidence does show, however, that ‘globalization’ may be a more relevant explanation of tropical forest transition than ‘modernization’ in certain cases, but that even this general driving force will not have the same outcomes in every place. Despite optimism, Madagascar will not become the ‘next Costa Rica’ any time soon, and new forests in Costa Rica may have more lessons to teach than data on forest cover can convey.

‘Globalization’ – the increased interconnectedness of people and ideas – has helped produce the modern concept of the ‘global commons’ of biodiversity. Indeed, the global spread of the environmental agenda has focused global attention on the planet’s richness in biological diversity and its current rapid erosion. Creating the ‘global biodiversity commons’ is in some senses a rhetorical ploy to engage and justify actions anywhere on the planet. Thus, solutions to biodiversity loss can be driven through globalization, whether through state-controlled conservation territories (pushed in far-off places by an international conservation agenda) or

through the liberal privatization agenda (as demonstrated in this paper case of Costa Rica). A third solution – one of community-based management systems – also has a global cheering squad (not least this conference), and is regaining some headway in contributing to the conservation of the global biodiversity commons (as hinted in this paper’s Malagasy case, but widespread across the world). A mix of all three forms of resource control – state, private, and community-based – will be needed to address the variety of contexts in which biodiversity conservation takes place and to be most effective in ‘saving’ any ‘global biodiversity commons’. Given the automatic support of current globalization processes for state-led and privatized forms of conservation, continued attention and support should be granted to community-based approaches.

REFERENCES CITED

- Aide, T. M., J. K. Zimmerman, L. Herrera, M. Rosario, and M. Serrano. 1995. Forest recovery in abandoned tropical pastures in Puerto Rico. *Forest Ecology and Management* 77: 77-86.
- ASANA and The Nature Conservancy. 2000. *Proyecto Corredor Biológico Paso de la Danta*. Puntarenas and San Jose, Costa Rica.
- Aubert, S., S. Razafiarison, and A. Bertrand, eds. 2003. *Déforestation et systèmes agraires à Madagascar*. Montpellier and Antananarivo: CIRAD/CITE/FOFIFA.
- Babin, D., ed. 2004. *Beyond Tropical Deforestation*. Paris: UNESCO/CIRAD.
- Barrett, C. B. 1994. Understanding uneven agricultural liberalisation in Madagascar. *Journal of Modern African Studies* 32 (3):449-476.
- Barrett, C. B. 1997. Food marketing liberalization and trader entry: evidence from Madagascar. *World Development* 25 (5):763-777.
- Bertrand, A. 2004. The spread of the Merina people in Madagascar and natural forest and eucalyptus stand dynamics. In *Beyond Tropical Deforestation*, ed. D. Babin. Paris: UNESCO/CIRAD.
- Blanc-Pamard, C., P. Milleville, M. Grouzis, F. Lasry, and Samuel Razanaka. 2005. Une alliance de disciplines sur une question environnemental: la déforestation en forêt des Mikea (Sud-Ouest de Madagascar). *Natures Sciences Sociétés* 13:7-20.

- Brockett, C.D. and R.R. Gottfried. 2002. State policies and the preservation of forest cover: lessons from contrasting public-policy regimes in Costa Rica. *Latin American Research Review* 37 (1):7-40.
- Campbell, L.M. 2002. Conservation narratives in Costa Rica: conflict and co-existence. *Development and Change* 33: 29-56.
- Crenn, C. 1998. L'espace migratoire franco-malgache: d'une migration temporaire à une migration définitive. *Les Cahiers du Cériem* 3:17-30.
- de Camino, R., O. Segura, L. G. Arias and I. Pérez. 2000. *Costa Rica Forest Strategy and the Evolution of Land Use*. Washington D.C.: The World Bank.
- Deininger, K. 2003. *Land Policies for Growth and Poverty Reduction*. Oxford: Oxford University Press and World Bank.
- Edelman, M. 1999. *Peasants Against Globalization: Rural Social Movements in Costa Rica*. Stanford: Stanford University Press.
- Edmond, R. 2003. Les aires protégées volontaires. *Ravintsara* 1 (2):3.
- EIU (Economist Intelligence Unit). 2004. *Madagascar Country Profile 2004*. London: Economist Intelligence Unit.
- Europa 1964-1990. *Europa Year Book*. London: Europa Publications.
- Fairhead, J. and M. Leach. 1996. *Misreading the African Landscape*. Cambridge: Cambridge University Press.
- Foster D.R., G. Motzkin, B. Slater. 1998. Land use history as long-term broad scale disturbance: Regional forest dynamics in central New England. *Ecosystems* 1: 96-119.
- Foster, A. D. and M. R. Rosenzweig. 2003. Economic growth and the rise of forests. *The Quarterly Journal of Economics* 118:601-637.
- Gezon, L. L. 2000. The changing face of NGOs: structure and *communitas* in conservation and development in Madagascar. *Urban Anthropology* 29 (2):181-215.
- GoM (Gouvernement de Madagascar) 2005. Evaluation de l'impact environnemental et social. Projet d'aire protégée de Nosy Tanikely (Nosy Be). Rapport 05-13072, Tecsalt International, fév. 2005.
- Goodman, S. M., and J. P. Benstead, eds. 2003. *The Natural History of Madagascar*. Chicago: University of Chicago Press.
- Grainger, A. 1995. The forest transition: an alternative approach. *Area* 27 (3): 242-251.

- Grau, H. R. T. M. Aide, J. K. Zimmerman, J. R. Thomlinson, E. Helmer, and X. Zou. 2003. The ecological consequences of socioeconomic and land-use changes in postagriculture Puerto Rico. *BioScience* 53 (12): 1159-1168.
- Green, G. M., and R. W. Sussman. 1990. Deforestation history of the eastern rain forests of Madagascar from satellite images. *Science* 248:212-215.
- Hall, C.A.S, C. Leon Perez, and G. Leclerc, eds. 2000. *Quantifying Sustainable Development: The Future of Tropical Economies*. San Diego and London: Academic Press.
- Hecht, S. 2004. Invisible forests: the political ecology of forest resurgence in El Salvador. In *Liberation Ecologies 2nd Ed.*, edited by R. Peet and M. Watts. London: Routledge.
- Hecht, S., S. Kandel, I. Gomes, N. Cuellar, and H. Rosa. 2006. Globalization, forest resurgence, and environmental politics in El Salvador. *World Development* 34 (2):in press.
- Janzen, D. H. ed. 1983. *Costa Rican Natural History*, Chicago: University of Chicago Press.
- Jarosz, L. 1996. Defining deforestation in Madagascar. 148-164 in *Liberation Ecologies*, eds. R. Peet and M. Watts. London: Routledge.
- Jokisch, B.D. 2002. Migration and agricultural change: the case of smallholder agriculture in highland Ecuador. *Human Ecology* 30 (4): 523 – 550.
- Kaimowitz, D. 1996. *Livestock and Deforestation in Central America in the 1980s and 1990*. Bangor, Indonesia: Center for International Forestry Research.
- Kistler, P., P. Messerli, and S. Wohlhauser, eds. 2001. *Culture sur Brûlis*. Antananarivo: Projet BEMA/FOFIFA et Projet EPB/ESSA Forêt.
- Kleinn, C., L. Corrales, and D. Morales. 2002. Forest area in Costa Rica: a comparative study of tropical forest cover estimates over time. *Environmental Monitoring and Assessment* 73: 17-40.
- Klooster, D. 2003. Forest transitions in Mexico: institutions and forests in a globalized countryside. *Professional Geographer* 55 (2): 227-237.
- Kull, C. A. 1996. The evolution of conservation efforts in Madagascar. *International Environmental Affairs* 8 (1):50-86.
- Kull, C. A. 2000. Deforestation, erosion, and fire: degradation myths in the environmental history of Madagascar. *Environment and History* 6 (4):421-50.
- Kull, C. A. 2005. Historical landscape photography as a tool for land use change research. *Norwegian Journal of Geography* 59 (4) in press.

- Lambin, E. F., and H. J. Geist. 2003. Regional differences in tropical deforestation. *Environment* 45 (6):22-36.
- Langholz, J., J. Lassoie and J. Schelhas. 2000. Incentives for biological conservation: Costa Rica's private wildlife refuge program. *Conservation Biology* 14(6): 1735-1743.
- Leopold, A. Carl, R. Andrus, A. Finkeldey, and D. Knowles. 2001. Attempting Restoration of Wet Tropical Forests in Costa Rica. *Forestry Ecology and Management* 142: 243-249.
- Marcus, R. R. 2004. Political change in Madagascar: Populist democracy or neopatrimonialism by another name? *ISS Paper No. 8*. Pretoria: Institute for Security Studies.
- Mather, A.S. and C.L. Needle. 1998. The forest transition: a theoretical basis. *Area* 30(2): 117-124.
- Mather, A.S., J. Fairbairn and C.L. Needle. 1999. The course and drivers of the forest transition: the case of France. *Journal of Rural Studies* 15(1): 65-90.
- Moran, E.F., E.S. Brondízio, J. Tucker, M.C. da Silva-Forsberg, I.C. Falesi and S. McCracken. 2000. Strategies for Amazonian forest regeneration: evidence for afforestation in five regions of the Brazilian Amazon. 129-149 in *Amazonia at the Crossroads* ed. A. Hall. London: Institute of Latin American Studies.
- Nielsen, E., and R. E. Rice. 2004. Sustainable forest management and conservation incentive agreements. *International Forestry Review* 6 (1):56-60.
- Perz, S.G. and D.L. Skole. 2003. Secondary forest expansion in the Brazilian Amazon and the refinement of forest transition theory. *Society and Natural Resources* 16: 277-294.
- PROCIG. 2001. *Análisis de Población y Agricultura Asociado a Áreas Silvestres Protegidas y Áreas de Conservación*, versión preliminar. San Jose, Costa Rica.
- Rabetaliana, H.. 2002. Madagascar, memory and change in mountain areas. Presented at UNEP African High Summit Conference, Nairobi.
- Raison, J.-P. 1969. Les travaux du service topographique de Madagascar et leur utilisation en sciences humaines. *Madagascar Revue de Géographie* 14:97-129.
- Raison, J.-P. 1984. *Les Hautes Terres de Madagascar et leurs Confins Occidentaux*. Paris: Karthala.
- Rivera, L. W., Zimmerman J. K., and T. M. Aide. 2000. Forest recovery in abandoned agricultural lands in a karst region of the Dominican Republic. *Plant Ecology* 148 (2):115-25.

- Rostow, W. W. 1960. *The Stages of Economic Growth*. Cambridge: Cambridge University Press.
- Rudel, T.K. 1998. Is there a forest transition? Deforestation, reforestation, and development. *Rural Sociology* 63(4): 533-552.
- Rudel, T.K. and Fu C. 1996. A requiem for the southern regionalists: reforestation in the South and the uses of regional social science. *Social Science Quarterly* 77 (4): 804-820.
- Rudel, T.K., D. Bates and R. Machinguiashi. 2002. A tropical forest transition? Agricultural change, out-migration, and secondary forests in the Ecuadorian Amazon. *Annals of the Association of American Geographers* 92(1): 87-102.
- Rudel, T.K., M. Perez-Lugo and H. Zichal. 2000. When fields revert to forest: development and spontaneous reforestation in post-war Puerto-Rico. *Professional Geographer* 52(3): 386-397.
- Rudel, T.K., O. Coomes, E. Moran, F. Achard, A. Angelsen, J. Xu, E. Lambin. 2005. Forest transitions: towards a global understanding of land use change. *Global Environmental Change* 15 (1): 23-31.
- Sandner, G. 1962. *La Colonización Agrícola de Costa Rica*. San Jose: Instituto Geográfico de Costa Rica.
- Schelhas, J. and Sanchez-Azofeifa, G. A. *in press*. Forest cover and socio-economic change adjacent to Braulio Carrillo National Park, Costa Rica. *Human Ecology*.
- Seddon, N., Joe T., J. W. Yount, J. R. Ramanampamonjy, S. Butchart, and H. Randrianizahana. 2000. Conservation issues and priorities in the Mikea Forest of south-west Madagascar. *Oryx* 34 (4):287-304.
- Sick, D. 1997. Coping with crisis: Costa Rican households and the international coffee market. *Ethnology* 36 (3): 255 – 275.
- Simmons, C. S., R.T. Walker, and C.H. Wood. 2002. Tree planting by small producers in the tropics: a comparative study of Brazil and Panama. *Agroforestry Systems* 56: 89-105.
- Simsik, M. J. 2002. The political ecology of biodiversity conservation in the Malagasy highlands. *GeoJournal* 58 (4):233-42.
- Snider, A.G., S.K. Pattanayak, E.O. Sills, and J.L. Schuler. 2003. Policy innovations for private forest management and conservation in Costa Rica. *Journal of Forestry* July/August.

- Southworth, J. and Tucker C. 2001. The influence of accessibility, local institutions, and socioeconomic factors on forest cover change in the mountains of western Honduras. *Mountain Research and Development* 21 (3): 276-283.
- Thacher, T., D.R. Lee and J.W. Schelhas. 1997. Farmer participation in reforestation incentive programs in Costa Rica. *Agroforestry Systems* 35: 269-289.
- Thrupp, L. A. 1990. Environmental initiatives in Costa Rica: a political ecology perspective. *Society and Natural Resources* 3:243-256.
- Truly, D. 2002. International retirement migration and tourism along the Lake Chapala Riviera: developing a matrix of retirement migration behaviour. *Tourism Geographies* 4 (3): 261-281.
- Vivanco, L. A. 2001. Spectacular quetzals, ecotourism, and environmental futures in Monte Verde, Costa Rica. *Ethnology* 40 (2):79-92.
- Williams, A.M., R. King, A. Warnes, and G. Patterson. 2000. Tourism and international retirement migration: new forms of an old relationship in southern Europe. *Tourism Geographies* 2 (1): 28-49.
- World Bank. 2005. *How Much is an Ecosystem Worth?* Washington DC: World Bank.
- WTO (World Tourism Organization) 2004. International tourist arrivals. www.world-tourism.org/facts/menu.html, accessed 28 Sept. 2005.
- Zbinden, S. and D.R. Lee. 2005. Paying for environmental services: an analysis of participation in Costa Rica's PSA Program. *World Development* 33 (2): 255-272.

Figure 1: Costa Rica and the Guabo Valley case study

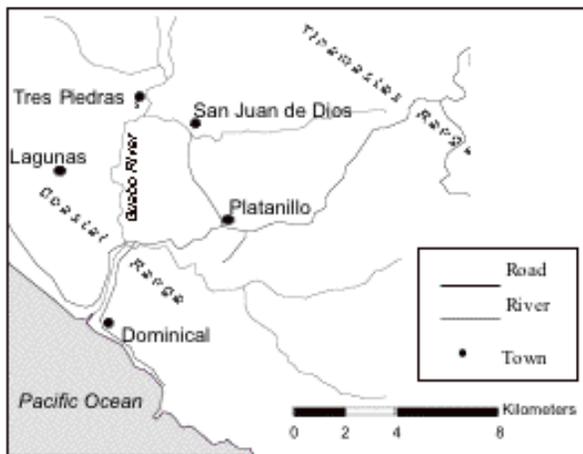


Figure 2: Forest cover change in Guabo Valley from 1973 to 1997. Based on supervised classification of rectified air photographs of 44.5 km² area centered on the two main communities in the valley, Tres Piedras and San Juan de Dios. Source of air photos: Instituto Geográfico Nacional de Costa Rica.

