Ecological Conservation and Rural Development in Latin America: The Case of Tortuguero, Costa Rica

Susan E. Place
University of New Mexico
Albuquerque, NM 87131

THE PROBLEM

The accelerating loss of the earth's natural ecosystem has been viewed in some circles with increasing alarm during recent decades. Recently scientists have become particularly interested in preserving the world's humid tropical forests, considered the richest, most complex terrestrial ecosystems on earth. Many fear that widespread deforestation in the tropics will precipitate adverse ecological changes. Ecologists from developed countries have already documented the environmental degradation that has followed short-sighted tropical ecosystem modification. Many have attempted to alert policy makers in tropical Third World nations to the dangers of economic exploitation without adequate consideration of ecological safeguards. A number of published research volumes reflect these concerns (College of William and Mary, Department of Anthropology 1981; Committee on Selected Biological Problems in the Humid Tropics, National Research Council 1982; Dasmann et al. 1973; Farnsworth and Golley 1973; Farvar and Milton 1972; Goodland and Irwin 1975; International Union for the Conservation of Nature and Natural Resources 1975; Smith 1981).

Conservationists, while focusing on long-term ecological health as a foundation for a sustainable economy, frequently fail to recognize the immediate implications of conservation for the inhabitants of affected areas. Only rarely is serious consideration given to the potential impact of such reserves on the subsistence or commercial economies of local residents. The populations of target areas are usually sparse and often made up of minority groups, who tend to be politically powerless, and whose welfare receives little consideration by national and international agencies that have other agendas to consider. In Latin America, as elsewhere in the Third World, many rural people, especially the poor, depend directly on the resources of their immediate environment for survival. Withdrawal of such resources removes the economic base of the rural poor, encouraging internal migration, often in the form of rural-urban and squatter movements, as well as fostering economic dependence on government programs where such are available.

The economic and social problems besetting many Latin American countries exacerbate the plight of the rural poor. Rapid population growth, insufficient job creation, and land hunger, often the product of the political economy of these countries, forces the rural poor into natural areas that are, or potentially could be, national parks or reserves. These parks could provide important economic "services," such as watershed and soil protection and preservation of important biological resources (especially pharmacologically active substances and genetic material for new or improved food crops). Thus rural development and ecological conservation often become competitive issues in Latin America, yet both are necessary to build the foundations of a more equitable and sustainable economic future for many countries.

The question becomes one of how best to integrate ecological conservation and economic development. Should a Latin American country develop its own models for national parks and nature reserves based on its unique constellation of social, economic, and political realities, rather than adhere strictly to models from developed countries? Given the overwhelming dependence of many *campesinos* on local ecosystems for fuel, construction materials, fence posts, pasturage, water, food, and medicine, it would be logical to try to integrate a basic needs approach to development with ecological conservation of the natural resources that provide basic necessities for the rural poor. Ecological conservation is, of course, needed outside of national parks as well as within the formal institution of a park or reserve. In some areas, however, the park concept may need to be modified to accommodate controlled use of renewable resources by local inhabitants. (See Sunquist 1984, for a relevant case study from Nepal.) An even more radical alternative has already been implemented by the Kuna Indians of Panama, whose Udirbi forest project may represent the world's only example of an indigenous group establishing and managing its own forest reserve. The Kunas' primary

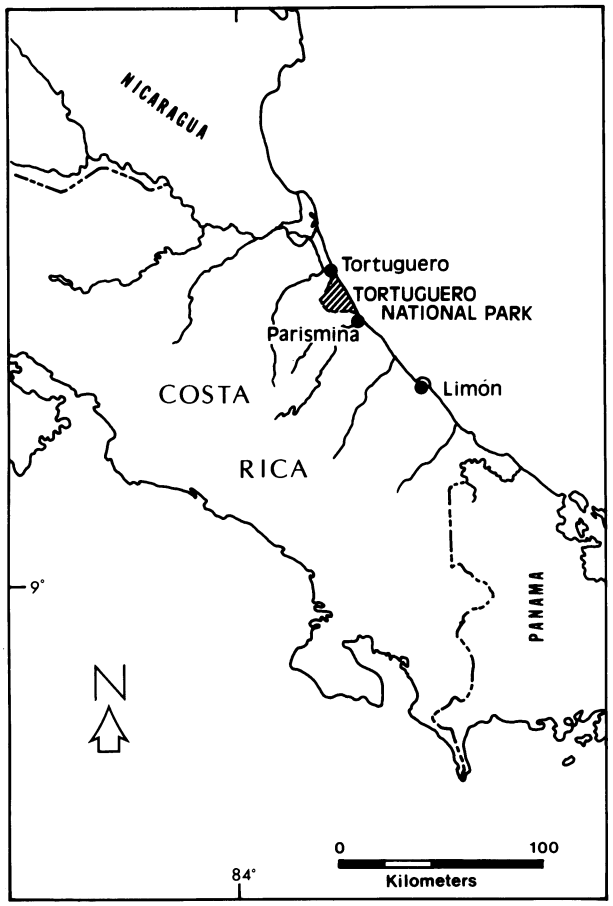

Fig. 1. Tortuguero.

objective is to preserve their culture by preserving the land base upon which their culture depends (Chapin 1984; Chapin and Breslin 1984). This indigenous effort represents an intriguing alternative for the Third World to state-run parks and reserves common in North America and Europe.

There has been little published research that focuses specifically on the social impacts of ecological conservation on rural people in the Third World. The published geographic literature generally approaches the issue peripherally, and usually only partially (Corraggio 1977; Nietschmann 1973, 1979; O'Keefe and Wisner 1977; Overton 1979; Samoff 1980). Only a handful of scholarly papers focus on the impact of national parks on local residents in Latin America (Olwig and Olwig 1979; Barker 1980). The literature on the nutritional effects of human ecological or land use changes is growing, but it does not usually address directly land withdrawn for conservation purposes (Dewey 1979, 1981; Eder 1978; Fleuret and Fleuret 1980). Thus it appears that geographers might fruitfully pursue research in this direction, which represents a new aspect of the people-land concern.

Another important question to consider is who benefits from the tourism attracted to national parks. There is a growing body of literature generated by the controversy over the role of international tourism in Third World development (e.g., Bond and Ladman 1980; Britton 1980; Bryden 1973; Carlozzi and Carlozzi 1968; Myers 1975; Pérez 1980; Turner 1976) that may help to answer this question about the benefits of national parks. This research suggests that for tourism to produce a positive social cost-benefit ratio, it must be organized in such a way that a large number of local people benefit from tourism, rather than merely bearing the burden of its costs (in both social and economic terms).

Analysis of the social costs and benefits of tourism should include consideration of a large number of questions. For example, what will be the impact of a proposed project on local land, energy, and food prices, and their effect on agricultural systems (and ultimately on diet and nutrition)? What type and how much new employment will be generated by tourism compared to employment lost from traditional occupations as a result of tourism? How will wage levels compare to the new cost of living created by tourist development? How much will it cost to provide the infrastructure for tourism? Who will benefit from it and who will pay for it? What proportion of revenues generated by tourist facilities will remain in local hands (and whose), and what proportion will flow to the country of origin of the tourists? How will pollution (especially from sewage and solid waste) be handled? This needs to be considered in terms of ecological, public health, and economic costs. What might be the social and cultural consequences of tourism? This should be considered in terms of the impact of phenomena such as prostitution and the loss of dignity among the local populace, as well as reduced access to natural resources (e.g., beaches, lakes, forests), which may be important to local people for cultural, as well as economic reasons. If such considerations are taken into account, and local involvement is encouraged during the planning stages of tourist developments, many of the negative consequences discussed in the literature cited above could be avoided. Healy and Zorn (1983), for example, describe how a communal, grassroots approach to tourism in Taquile on Lake Titicaca, Peru, has helped the village economy while minimizing negative social impacts.

This paper will focus on the impact on the village of Tortuguero (fig. 1) of the creation of a national park nearby, along the Caribbean coast of Costa Rica. The creation of Tortuguero National Park in 1975 profoundly affected the lives of the nearby villagers. Their current situation reiterates a number of the questions about the role of national parks in Latin American development raised above. Fieldwork for this paper was done primarily during the summer of 1983, as well as during previous research in Costa Rica in 1977–78 and 1979.

THE STUDY SITE

Tortuguero, a village of about 200 inhabitants, is located on the northern end of a 22-mile stretch of sand that is the major nesting beach of the endangered Caribbean green sea turtle (*Chelonia mydas;*). Concern for the preservation of this ancient species led to the des-

ignation of a national park along the beach. The original concept of the park was expanded to include conservation of lowland rainforest, as a result of fears that the rapidly advancing frontier of agricultural settlement would soon deforest all of Costa Rica's Atlantic watershed. Thus, in addition to the beach, Tortuguero National Park includes about 20,000 hectares of lowland rainforest, as well as an extensive network of rivers and lagoons. All forms of economic exploitation—hunting, lumbering, farming—are prohibited in the park. No turtles may be taken within 12 miles of the shore.

The Tortuguero region is one of the wettest in Costa Rica, receiving an average of about 5,800 mm of rain annually. Much of the area is low and swampy, with heavy clay soils that impede drainage. These soils tend to be difficult to work. The areas that are inundated much of the year have various types of swamp forest with low-growing trees. Near the coast these swamps are dominated by a single species of palms, *Raphia taedijera* (Hartshorn et al. 1982). The higher, better drained parts of the coastal plain support diverse tropical rainforest, which contains a number of economically important tree species. Tortuguero National Park was designed to protect a large stand of this type of forest.

THE TRADITIONAL ECONOMY

Green turtles formerly provided one of the mainstays of the economy of Tortuguero, and, indeed, gave the village its name. During the nesting season (June-October) the turtles supplied abundant protein in the form of meat and eggs. These migratory animals were so numerous during the nesting season that they provided a source of cash income as well as subsistence. The villagers sold meat and eggs to middlemen in Limón, Costa Rica's major Caribbean port, which lies about 50 miles south of Tortuguero. In addition, the villagers sold the shells of the less abundant hawksbill turtle. The men also hunted a number of forest and river species for meat, including pacas (*Agouti paca*), white-lipped and collared peccaries (*Tayassu pecari, T. tajacu*), brocket deer (*Mazama americana*), curassows (*Crax rubra*), crested guans (*Penelope puprascens), and manatees (Trichechus manatus*). A few species were hunted for commercial purposes, especially for skins, including crocodiles (*Crocodylus acutus*), and ocelots (*Felis pardalis*). In order to attract the ocelots, the hunters killed monkeys for bait (Boza and Mendoza 1981).

A number of people farmed in the area that is now incorporated in the national park. These farms provided both subsistence crops, such as manioc, yams, *tiquisque* (a New World variety of taro), breadfruit, bananas, and plantains, and cash crops, such as coconut and cacao. Cacao trees still appear frequently in the understory of the forest, hinting at the agricultural history of the area.

The traditional diet of Tortuguero was based largely on meat: turtle, peccary, paca, manatee, curassow, and various fish species were mainstays. On the side, people had plantain, breadfruit, or manioc. They ate very little rice and beans, the staples of the Costa Rican diet. As one local resident told me, "We were carnivores then." And that is how they would still prefer to eat, according to various local informants.

THE BOOM AND BUST CYCLE

Penetration by the global economy during this century adds another dimension to the situation described above. Tortuguero shares a history of boom and bust economic cycles with most of the Caribbean world. Change generated by outside markets and social systems has molded the economic and cultural systems of Tortuguero. Now the villagers must adapt more to external systems than to their own local conditions. In particular, they must adapt to market forces and government policies over which they have no control, a situation common throughout the western Caribbean. (See Nietschmann 1979, for a good summary of this phenomenon.)

About the turn of the century the turtle boom began, which may have been responsible for establishing Tortuguero as it is today. For a time, an eighteen-ton boat made regular trips to Tortuguero and other coastal villages to collect turtles and take them to the crawls in Limón, where they awaited shipment to Europe and the United States. Thus, virtually from its origins, Tortuguero was at least partially linked with the global economy, making it vulnerable to fluctuations in commodity prices, although most of the villagers were apparently self-sufficient in food, for the most part. Somewhat later, the area became a supplier of natural rubber, tapped from wild trees. This source of income declined before the next boom, lumber, took off.

Lumbering for the export market began in the 1940s and boomed in the 1950s. It transformed Tortuguero, quadrupling its population, leading to the establishment of a school, company stores, and even to occasional visits by a doctor. The lumber companies failed, however, and the last one closed in 1972, leaving a greatly overpopulated village facing economic hardship. Most former lumber workers left for more promising locations, while some of the original families and a few newcomers remained. They reverted to a certain extent to the old traditional subsistence activities, but their outlook and desires had been changed by their short-lived entry into the global market from which they were now excluded. Today many villagers are unemployed or underemployed, while opportunities for farming are more limited than previously.

THE IMPACT OF THE NATIONAL PARK

The establishment of the national park in 1975 withdrew many resources from the subsistence system of the people of Tortuguero. Their most important sources of meat were suddenly off-limits. Also, as the park was designed to preserve the highly diverse rainforest on the better drained sites, many of the better agricultural soils in the

immediate vicinity of the village lay within the boundaries of the park. Much of the area outside the park boundaries is comprised of *Raphia* swamps, which are not well suited to the type of agriculture practiced in Tortuguero. After the park was created, many villagers had to buy new land, sometimes of lower quality, at a greater distance from Tortuguero, requiring a long trip by dugout canoe. Other villagers now rely largely on purchased food, rather than to suffer the inconvenience of paddling long distances to new farmland.

According to the villagers that I interviewed in 1983, their diets have changed substantially, particularly in terms of the amount of animal protein consumed. Today they rely heavily on rice and beans, and there is little variety in their diets. Rice is grown locally but beans do not grow well in the region and must be imported. Fruit trees provide a little seasonal variety to the Tortuguero diet, but only a limited number of species seem to survive there. Those people with farms also produce manioc, yams, *tiquisque,* and bananas to supplement their diet of rice and beans. Most villagers consume much less animal protein than previously, with fish being the major source. Generally only men and boys fish, however, so those households without resident males have little access to fish. The National Park Service (SPN) allows two green turtles to be slaughtered per week during the nesting season to help supply Tortuguero with meat, but several villagers complained that this does not meet their families' needs. Both turtle meat and beans must be purchased, so most villagers must have some source of income to assure that they obtain at least a minimal amount of protein in their diets. Poaching probably provides a small but unknown amount of game meat for some families. My informants explained that if a man poached he would not tell anyone for fear of being punished by the authorities, so they did not know how much poaching actually occurs.

Sources of cash income have also been affected by the creation of the national park. Villagers can no longer exploit commercially the sea turtles or terrestrial wildlife. A certain amount of illegal turtling continues, however, mostly by men from Limón; during the turtle nesting season their harpoon boats frequently are seen offshore near Tortuguero. Little paid local employment has been generated to replace lost income from the exploitation of the park's biological resources. The park employs only three villagers on a regular, full-time basis. The SPN fears that if it hires local men as guards, they will allow their friends and relatives to poach. Consequently, as a matter of policy park guards are brought in from other parts of Costa Rica. A couple of small tourist accommodations employ local people, so that the park, by attracting tourists and researchers, indirectly helps increase local employment. Also, during the green turtle nesting season, a turtle tagging and research station employs several villagers for about three months. At present, employment opportunity is clearly quite limited, and as a result many families have at least one member working elsewhere in Costa Rica.

Tortuguero's population is a noticeably young one, with a very high proportion of children, most of whom may have to migrate elsewhere to work. Such a situation might have occurred even if the park had not been established, but the park has exacerbated the problem. It can also be argued, however that had the turtles not been protected, over-exploitation might have reduced populations so severely that nature, rather than the state, might have removed a major part of Tortuguero's subsistence system. Indeed, Neitschmann (1973, 1979) has demonstrated clearly how rapidly turtle populations can be depleted by over-exploitation.

CONCLUSIONS

While the creation of Tortuguero National Park fulfills certain important national and international objectives, it has had negative impacts on the local inhabitants. On the other hand, it also has the potential for creating a more stable and sustainable economy for Tortuguero in the future, if certain problems are eliminated. Some problems are administrative and could be solved fairly easily. For example, relations between the park administration and the villagers are strained, largely because of the type of administrator brought in from the capital. This could be remedied by a change of personnel and a concerted effort to involve the local people in the operation of the park. Currently the villagers feel alienated and resentful of the park, which reduces its efficacy, as the people do not respect it nor understand why it has been created.

Another problem is that the frequent appearance of harpoon boats from Limón along Tortuguero's beach increases the villagers' resentment. They see outsiders taking "their" resource with impunity, while they lose its benefits because of laws imposed on them by the government. The SPN must find a way to enforce the law protecting the turtles from *all* exploitation. This will require increased funding and training of personnel. It could also provide employment for local people, who have an inherent interest in protecting the turtles, although not all of the villagers are now aware of that. A good educational program and effective communication between the park and the village could raise public consciousness about the value of the turtles. Such programs have been effective elsewhere in Costa Rica and should succeed in Tortuguero as well.

If the park and the villagers could work together, Tortuguero might benefit from sustained growth in tourism, provided the various potential problems related to tourism are addressed. Such tourism could have a substantial domestic component, which could eliminate some of the boom and bust problems associated with international tourism in the Caribbean region (Bryden 1973; Carlozzi and Carlozzi 1968). The park will also continue to attract a steady stream of "scientific" tourism, because of the unique green turtle rookery and the increasing rarity of

the tropical rainforest biome. Tourism based on rare biological or cultural resources appears to have made a successful start in several places in Latin America (Chapin 1984; Healy and Zorn 1983). By learning from successful ventures and from the mistakes made in other regions, Tortuguero may be able to develop its tourist potential in such a way that the villagers reap many of the benefits of tourism, not merely paying its costs. If the people of Tortuguero can replace income generated by exploiting rare and endangered biological resources with income generated by regular and sustained tourism, perhaps both the people and the environment will face a more secure future.

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