

MANAGING MANKÒTÈ MANGROVE

Some people call mangroves “the roots of the sea.” Mangroves are gnarled, salt-tolerant trees that grow in intertidal zones and estuaries where the ocean, land, and freshwater meet; they cling to the loose soils, sands, and muds with a maze of roots that can withstand waves and erosion. These unique, adaptable plants, of which there are about 60 species, are found along the majority of the world’s subtropical and tropical coastlines.

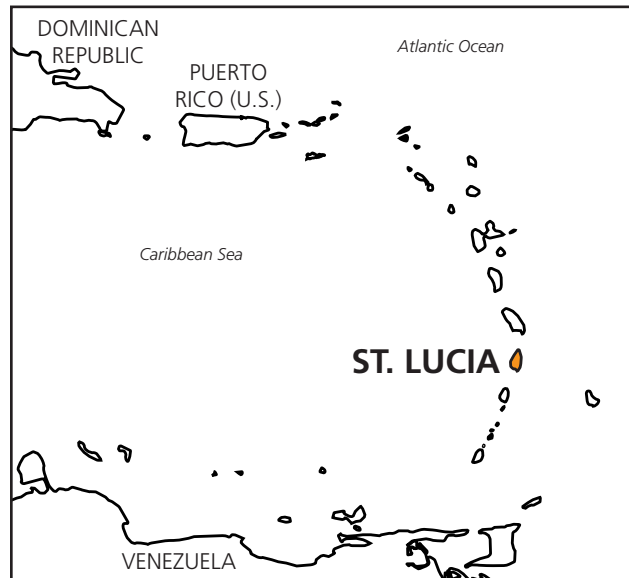
Some coastal residents might also call mangroves “the roots of their community.” The forests, swamps, and wetlands where mangroves thrive are ecosystems of great biodiversity and productivity. Coastal residents use mangroves for fuel, construction materials, food, medicines, and tannins. For fishers the mangroves’ networks of roots provide breeding grounds for many kinds of sea life. The leaves, small branches, propagules, and fruit that fall from the trees contribute to production of detritus that supply the fish and other wildlife with an abundant food supply. Mangroves are also prime nesting and migratory sites for hundreds of bird species. By serving as a buffer along the coastline, mangrove forests protect coastal areas, crops, and towns from flooding during storms, shelter fishers’ boats, and protect coral reefs from suspended solids. Plus, mangroves control sedimentation and coastal erosion.

But a mangrove’s natural resilience and value affords it little protection against a growing number of anthropogenic threats, as communities and institutions on St. Lucia’s southeast coast came to understand in the 1980s. That realization inspired an innovative program to enable local residents to reap the benefits of Mankòtè, St. Lucia’s largest mangrove forest, without degrading its ecosystem services and long-term viability.

Changing Community Practices

Mankòtè was part of a U.S. military base during World War II. When the base closed and the area became public land in 1960, the 63-ha mangrove—20 percent of the total mangrove area of the country—was still covered with well-developed trees (Geoghegan and Smith 1998:1). As an open-access resource, it was soon subjected to varied and often destructive uses ranging from seasonal fishing, bird hunting, and crab catching to waste dumping and spraying of pesticides for mosquito eradication (Smith and Berkes 1993:123–124).

The greatest stress on the mangrove, however, was the extensive tree cutting by local citizens for commercial charcoal production. By the early 1980s, charcoal production had become a major source of subsistence income and an impor-



tant cottage industry. The use of mangrove wood for charcoal is popular because it is cheap relative to petroleum-based fuels, can be easily transported, and is slow burning. Mankòtè became the main supply of charcoal for about 15,000 residents of Vieux Fort, a nearby community, and others in the southeast portion of the island. Although no data are available, older residents of the area observed that during those years, smaller trees in the mangrove were being harvested and large trees were becoming scarce (Smith 2000).

At about the same time, a regional NGO, the Caribbean Natural Resources Institute (CANARI), identified the Mankòtè mangrove as a priority area for conservation. CANARI soon realized that the charcoal producers themselves were key to Mankòtè’s protection. Although charcoal producers’ harvests were putting pressure on Mankòtè, they practiced a number of sound management measures. For example, they cut on a rotational basis, allowing time for the trees to regenerate before recutting, and left uncut the species of mangroves that make poor charcoal but provide cover to impede the evaporation of the swamp.

CANARI proposed a management strategy that was innovative and controversial for its time. They advocated that the mangrove be managed in collaboration with the harvesters—a landless, poor group with no legal right to the resource, but also the people most dependent on the mangrove and most damaging to it. With the government’s tacit approval, CANARI launched what has become an ongoing effort to test ways to save the mangrove and maintain the charcoal producers’ incomes (Geoghegan and Smith 1998:4, 7).

Among CANARI’s key steps was to organize the harvesters into an informal cooperative of about 15 people; the cooperative is called the Aupicon Charcoal and Agricultural Produc-

The woodlot, as originally conceived, was to be managed by and benefit the group as a whole. Members would be organized for harvests and other activities. Similarly, pole production in the mangrove was meant to be a group activity. However, it has proven easier for people to continue using the mangrove and the woodlot without strict coordination of activities. Extractions are made by individuals or small teams and recorded each month.

ers Group (ACAPG). CANARI works with the group to monitor and track trends in charcoal production and the status of the mangroves. ACAPG committed to a set of sustainable harvesting practices, including a ban on cutting trees that line waterways, preservation of large trees, and cutting on a slant to preserve the tree's stump.

To reduce pressures on the mangrove, government agencies, local NGOs, and the harvesters sought to create a new wood supply for charcoal production. Between 1983 and 1985, the Department of Forest and Lands planted a 62-ha woodlot close to Mankòtè with fast-growing hardwoods, mainly *Leucaena*, and with a palm species that ACAPG members can harvest to make brooms. The government also loaned the producers a large plot of land and encouraged the producers to plant it with marketable products.

There have been significant communal harvests of plantation wood recently, although initial efforts in plantation and agricultural endeavors were plagued with problems, from fires to the charcoal producers' inexperience with agriculture, marketing, and working together. The woodlot is still far from a replacement for mangroves, but management strategies and income-diversifying opportunities continue to evolve. For example, in 1993 the harvesters began leading tourists and school groups on tours of the mangrove as an income-generating opportunity. Local NGOs have provided guide training; technical assistance grants to build interpretive signs, a boardwalk, and a viewing tower; and assisted with tour promotion and organization (Smith 2000; Brown 1996).

To limit outside threats to the mangrove, local institutions successfully protested the Department of Health's mosquito eradication program that was damaging the mangrove's fauna and hydrological functions, and secured the designation of Mankòtè as a marine reserve in 1986. That designation affords the mangrove complete protection from any extractive use without written permission of the Chief Fisheries Officer, ending years of illegal waste dumping. The charcoal producers have sole rights of use of timber resources (Smith 1999).

Like most participatory approaches to ecosystem management, the Mankòtè strategy has taken more than a decade to achieve many of its objectives. By the 1980s, the overall trend



of degradation of the tree cover had been reversed. Monitoring four species of trees in each of four transects between 1986 and 1992 showed a significant increase in the number of mangrove stems larger than 25 mm/m²—from 0.10 to almost 2 (Smith and Berkes 1993:126–127). The basal area, or total area of stems, increased fourfold. Because 1991 was a year of particularly high charcoal production, the increased regeneration of mangroves noted in the 1992 survey is especially noteworthy. Field observations and interviews indicate that preservation methods are still used rather than clear-cutting (Smith and Berkes 1993:126–127). Although the data are still limited, research in the last several years suggests that density and size of trees have continued to increase, while charcoal production has averaged 2 tons/month in early 2000, slightly less than the average in the past 15 years (Smith 2000).

Mankòtè's future is still uncertain. An economic downturn in St. Lucia could bring new pressures to the mangrove. The government continuously receives proposals for the development of the mangrove and surrounding land; fortunately, key agencies are concerned about identifying what kind of development would be possible without encroaching on the mangrove and its functions. Research is under way to ascertain other potentially significant pressures on the mangrove, including the impacts of crab hunting and fishing, and to test the effectiveness of some silviculture practices in the mangrove, with the hope of improving yields from regeneration. Nevertheless, there is agreement among all parties that the informal, collaborative arrangement at Mankòtè currently provides greater protection to the mangrove than any government agency or other institution can do on its own. The arrangement has also allowed rural families to continue to reap economic benefits.