

CASE STUDY ON BENEFIT SHARING ARRANGEMENTS – MANKOTE MANGROVE

1. OVERVIEW

Main actors involved:

- a. Department of Fisheries; Due to the fact that Mankote is a declared Marine Reserve under the Fisheries Act (No. 10 of 1986) it falls under the jurisdiction of the Department of Fisheries for active management.
- b. Aupicon Charcoal and Agricultural Producers Group (ACAPG): An informal cooperative of about 15 individuals who harvest mangrove wood to produce charcoal.
- c. CANARI: formerly ECNAMP (Eastern Caribbean Natural Area Management Programme) which in 1989 became The Caribbean Natural Resource Institute is a non governmental organization which has been involved in the management and monitoring of activities regarding Mankote since 1981. They were largely responsible for organizing the harvesters into the informal cooperative. The area is currently being co-managed by the DOF and CANARI and the local group of charcoal producers who have also expanded into ecotourism activities, such as bird watching within the mangal.

The type of benefit-sharing arrangement that has been produced: Although the charcoal harvesters were putting pressure on Mankote, 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 species of mangroves that make poor charcoal but provide cover to impede the evaporation of the swamp (World Resource Institute). CANARI 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) in WRI 2000-2001)

The ecosystem- Mangrove description

These mangal systems serve very important functions in maintaining the health of ecosystems- maintaining coastal stability, fish breeding and nursery ground, avifauna habitat, silt trap, water quality maintenance and nutrient exporter. They contribute to biological productivity by recycling nutrients from leaf decomposition.

The diversity of this habitat type in St. Lucia ranges from a few scattered scrub patches to the more diverse riverine and fringing mangal systems. Mangroves account for about 179.3 hectares, which represents 0.29% of the islands landmass.

There are many threats to this ecosystem in St. Lucia today. The general public generally regards such systems as a health threat which should be eradicated. They see them as breeding grounds for mosquitoes. These sites are then targeted for landfills, solid waste

disposal and deforestation. St. Lucia has since 1986 moved to protect a number of mangroves around the island declaring them as marine reserves.

The Mankote mangrove is a basin mangrove which at 40 hectares is the largest mangrove in St. Lucia. The Crown has ownership of this land. It represents 20% of the total mangrove area in St. Lucia (Portecop and Benito-Espinal 1985). Mangrove species identified there include the red (*Rhizophora mangle*), black (*Avicennia germinans* and *Avicennia schaueriana*), white (*Laguncularia racemosa*) and buttonwood (*Conocarpus erecta*) (Conservation & Sustainable livelihoods). Mankote is critical to the protection of wildlife and for the control of erosion.

The Time frame addressed; The area had been under use and misuse from 1960 when after the WWII and the closure of an American air base established on the site, Mankote was returned to the government and the general populace began exploiting it for subsistence purposes. By 1980's, charcoal production had become a major source of subsistence income and an important cottage industry. Mankote became the main supply of charcoal for about 15,000 residents of Vieux Fort and others in the southeast portion of the island (WRI 2000-2001). With the collaboration between CANARI and the ACAPG, by the 1980's the overall trend of degradation of the tree cover had been reversed. Monitoring of the four main 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).

It is acknowledged that Mankote's future is still uncertain. There are various ventures proposed currently before the government which could jeopardize this ecosystem. It is therefore imperative that concerned institutions maintain research on "other potentially significant pressures on the mangrove" and test the effectiveness of current silvicultural practices and the impact on the wildlife (WRI). Monitoring should include other potential environmental threats particularly SLR (sea level rise) due to climate change and solid waste disposal from domestic or industrial sources.

Mankote Mangrove: Its relevance to the Bioiversity Convention

St. Lucia's national conservation policies and legislation supports the effort of sustainable resource use in the Mankote Mangrove. It also subscribes to the ideals expressed in CBD. The articles and their objectives which apply to this project are:

Article 6: General measures for conservation and sustainable use

(a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Article 7: Identification and monitoring

(a) Identify components of biological diversity important for its conservation and sustainable use.

(b) Monitor, through sampling and other techniques, the components of biological diversity, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use

(c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques; and

(d) Maintain and organize, by any mechanism data, derived from identification and monitoring activities.

Article 8: *In-situ* conservation

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- (d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- (e) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;
- (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies;
- (i) *Endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;*
- (j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustain-able use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the *equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;*
- (k) Develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;

Article 10: Sustainable use of components of biological diversity

- (a) Integrate consideration of the conservation and sustainable use of biological resources into national decision-making;
- (b) Adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity;
- (c) *Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements;*
- (d) Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and
- (e) *Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources.*

Article 12: Research and training

- (a) Establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components and provide support for such education and training for the specific needs of developing countries;
- (b) Promote and encourage research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries

Other relevant articles that support the current management approach to Mankote

Mangrove include 13 and 14.

2. Description of the Context

The status of the ecosystem: Mankote was declared as a protected area in 1986 as the largest contiguous tract of mangrove. However the site is currently harvested for charcoal, the mangrove and surrounding private property is continuously targeted for development by entrepreneurs. “There is agreement among all parties that the informal,

collaborative arrangement at Mankote currently provides greater protection to the mangrove than any government agency or other institution can do on its own. (WRI2000-2001)”

Mankote Mangrove’s Biological Resources

Wildlife

List of birds utilizing the Mankote Mangrove and environs

Local Species	
Scientific name	Common Name
<i>Bubulcus ibis</i>	Cattle egret
<i>Butorides virescens</i>	Green Heron
<i>Coereba flaveola</i>	Bananaquit
<i>Dendroica adelaidae</i>	Adelaides Warbler
<i>Elaenia martinica</i>	Caribbean elaenia
<i>Eulampis holosericeus</i>	Green throated Carib
<i>Icterus laudabilis</i>	St. Lucia Oriole
<i>Loxigilla noctis</i>	Lesseer Antillean bullfinch
<i>Orthorhyncus cristatus</i>	Antillean crested hummingbird
<i>Quiscalus lugubris</i>	Carib grackle
<i>Saltator albicollis</i>	Lesser Antillean saltator
<i>Vireo altiloquus</i>	Black whiskered Vireo

Migratory Species	
Scientific name	Common Name
<i>Anas americana</i>	American widgeon
<i>Anas discors</i>	Blue winged teal
<i>Ardea alba</i>	Greater egret
<i>Ardea herodias</i>	Greater blue heron
<i>Arenaria interpres</i>	Ruddy turnstones
<i>Atitis macularia</i>	Spotted sandpiper
<i>Aythya affinis</i>	Lesser scaup
<i>Calidris alba</i>	Sanderling
<i>Calidris fuscicollis</i>	White rumped sandpiper
<i>Calidris himantopus</i>	Stilt snadpiper
<i>Calidris mauri</i>	Western Sanpiper
<i>Calidris melanotos</i>	Pectoral Sandpiper
<i>Calidris minutilla</i>	Least Sandpiper
<i>Calidris pusilla</i>	Semipalmated sandpiper

<i>Catoptrophorus semipalmatus</i>	Willet
<i>Ceryle alcyon</i>	Belted kingfisher
<i>Charadrius semipalmatus</i>	Semipalmated Plover
<i>Circus cyaneus</i>	Northern Harrier
<i>Dendrocygna autumnalis</i>	Black bellied whistling duck
<i>Egretta gularis</i>	Western Reef Heron
<i>Egretta thula</i>	Snowy egret
<i>Egretta tricolor</i>	Tricolor heron
<i>Falco columbarius</i>	Merlin
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Fulica caribaea</i>	Caribbean Coot
<i>Limnodromus griseus</i>	Short billed Dowitcher
<i>Limosa haemastica</i>	Hudsonian Godwit
<i>Numenius phaeopus</i>	Whimbrel
<i>Pandion haliaetus</i>	Osprey
<i>Pluvialis squatarola</i>	Black bellied plover
<i>Porphyryla martinica</i>	Purple gallinule
<i>Porzana Carolina</i>	Sora
<i>Protonotaria citrea</i>	Prothonotary Warbler
<i>Seirus motacilla</i>	Louisiana waterthrush
<i>Seirus noveboracensis</i>	Northern waterthrush
<i>Tringa flavipes</i>	Lesser yellowlegs
<i>Tringa melanoleuca</i>	Greater Yellowlegs
<i>Tringa solitaria</i>	Solitary sandpiper

Marine

Scientific name	
<i>Centropomus undecimalis</i>	<i>Crassostrea rhizophorae</i>
<i>Oreochromis mossambicus</i>	<i>Penaeus (Farfantepenaeus) subtilis</i>
<i>Oreochromis nilotica</i>	<i>Lebistes spp.</i>
<i>Paguristes erythrops</i>	<i>Callinectes danae</i>
<i>Eleotris spp.</i>	<i>Lutjanus griseus</i>
<i>Dormitator maculatus</i>	<i>Eucinostomus jonsei</i>
<i>Cardisoma guanhuma</i>	<i>Erotelis smargdus</i>
<i>Bathygobius soporator</i>	<i>Caranx hippos</i>
<i>Sesarme spp.</i>	<i>Gymnothorax funebris</i>
<i>Tarpon atlanticus</i>	
<i>Mugil curema</i>	
<i>Ucides cordatus</i>	
<i>Uca mordax</i>	
De Beauville-Scott, S. 2000	

Plants

Scientific Name
<i>Sophora tomentosa</i>
<i>Sporobolus spp.</i>
<i>Cocos nucifera</i>
<i>Sesuvium portulacastrum</i>
<i>Fimbristylis spathacea</i>
<i>Spartina patens</i>
<i>Rhizophora mangle</i>
<i>Avicennia germinas</i>
<i>Laguncularia racemosa</i>
<i>Conocarpus erecta</i>

Portecop and Espinal (1985)

The mangrove has been targeted for development in the past, particularly for large scale resorts and golf course development. The most important resource use is charcoal production which remains a vital cottage industry undertaken by small-scale producers. Secondary use includes activities such as seasonal fishing, bird hunting, crab hunting, therapeutic bathing, and wood harvesting for construction (Smith and Berkes). Charcoal has remained an important fuel source inspite of the increasing use of propane gas. Charcoal is used for barbecuing and is considered to be more efficient for lengthy cooking times.

Each charcoal producer uses one cutting area per season (two seasons per year, before and after the rains),and rotates cutting areas, returning to a cut-over area after about two years. They cut selectively in strips of 10-20 m. zig-zagging to access clusters of suitable stems. Cutting area of each is generally known to others in a given season; this helps avoid conflicts. Related individuals often cut in adjacent areas to facilitate exchange of help. Cut stems are placed in rectangular pits dug in the forest floor, about 4-6m long,

partially covered with grass or leaves and then with soil, and fired for three days. The charcoal is then bagged in old flour sacks, each sack holding about 22 kg and selling for about EC \$30 (US \$11 in 1992). Charcoal is retailed in smaller lots in the town market and in rural areas. (Smith, A. H. and F. Berkes. 1993)

The institutional and organizational structure of local communities and concerned institutions including their decision-making processes

Mankote is adjacent to Vieux Fort which is an urban commercial district which hosts the major international airport, a number of hotels, major docking facilities and an industrial complex. It is the second highest population center in St. Lucia (#?). There are other nearby communities which are mainly rural and are primarily agricultural or fisheries (e.g. Laborie, Micoud). The primary institutions involve local government (eg. Vieux Fort Town Council).

Most of the charcoal produced from the Mankote mangrove is sold in the local market and commercial area in Vieux Fort. Most of the destruction of the mangrove was from residents of Vieux Fort and adjacent communities.

Legal or policy measures behind the arrangement

There are existing policies and legislative acts which support the traditional practice of harvesting of the mangrove for charcoal. Acts such as the Forest, Soil and Water Conservation Ordinance (1946) and the Wildlife Protection Act (1980) provide the framework for regulating harvesting activities. However, the process of empowering the

subsistence producers has produced beneficial results in terms of the protection of the mangrove and the government has granted tacit approval. Current data shows that the basal area of the mangrove to be increasing based on research by CANARI

3. Purpose/Objectives of the Benefit Sharing Arrangements

The reasons and objectives for the different actors which entered into the benefit sharing arrangement.

The Mankote mangrove was in decline due to unregulated fishing, spraying of pesticides, cutting of tracks, timber harvesting, and waste dumping,. These issues were leading to severe environmental problems. In order to encourage rational development planning, St. Lucia National Trust in 1981 proposed a study of conservation and development requirements for the south east coast. The concept was accepted by government and the study was conducted by ECNAMP. The condition, use and conservation requirements of Mankote were given prominence-(Smith, A. H. and F. Berkes.1993)

The charcoal producers who were working in the mangroves were poor landless individuals and families of the lowest social and economic levels in the society. Because of their lack of options, their dependence on the mangrove was great. Research efforts of CANARI and the local secondary school produced interesting findings showing that the local charcoal producers practiced a number of management measures to sustain the resource base. For example by cutting on rotational basis, allowing the trees to regenerate for two or three years before cutting. They also left the *Avicennia* trees, said to make poor charcoal, uncut to provide cover to impede evaporation of the swamp. The report

recommended the development of a management plan for the mangrove that would take an “experimental approach, which attempts to respect existing popular uses and attitudes, while fully involving users in the decision –making process” and that would permit the reinforcement of popular practices and the introduction, where necessary, of new techniques to increase production while reducing adverse environmental impacts (ECNAMP 1983). These recommendations demonstrated an early recognition of the stakeholder rights of subsistence users, even those without legal rights to the resources being exploited. These stakeholder rights are now widely respected.

4. Process for Establishing of the Arrangements

The early stages involved dialogue with the charcoal producers, obtaining information on traditional harvest practices and management measures. Procedures as to areas to be cut, the informal rotation system and how it was affected by seasonal changes in the water level, and reasons for the selection of the species were obtained.

A monitoring programme was established in 1986, designed to estimate the rate of exploitation and trends in the status of the mangrove tree biomass. The ACAPG records the number of bags of charcoal produced by each group member each month, and the density and mean stand diameter of the four mangrove tree species are estimated periodically using standard transect or quadrat methods. The data are managed by CANARI, and the results of monitorings are shared with the ACAPG through regular meetings and discussions.

As a result of this dialogue, the following rules have been agreed upon by ACAPG and other agents involved (CANARI, DOF, Forestry Department.)

- Preservation of young branches, determined by the harvesters by level of maturity and by others by stem size (less than 50 mm in diameter);
- No cutting of red mangrove trees that line the waterways;
- Preservation of large trees for seeds shade, and shelter for birds;
- Careful stacking of stash to allow resprouting, or coppicing, of stumps;
- Cutting at a slant without splitting the stump, and cutting at sufficient height above the ground to prevent rotting;
- Cutting only the wood needed for one pit at a time, in order to prevent loss of stockpiled wood from rain, flooding or pilferage.

This set of rules, which has been followed by members of ACAPG for some time, has recently been incorporated into their membership agreement. The rules also form the

basis for a draft management agreement that was sent to the appropriate agencies for review in 1993.

This arrangement has grown to incorporate a tour guiding operation within the reserve. The group has upgraded the entrance to the mangrove area, established a viewing tower and a well maintained trail. The presence of the ACAPG has allowed the Department of Fisheries, which is responsible for marine reserves, to manage the area cost effectively through a strategy of user participation rather than direct involvement. In September 1996, the Department formalized the longstanding *de facto* agreement authorizing the ACAPG members and no others, to use the mangrove for purposes of managed cutting for fuelwood. The groups participation in the project has been directly linked to the benefits they have been able to reap as individuals through their involvement, including an increased and more secure supply of wood for charcoal; alternative forms of employment and revenue through agriculture and tour guiding ; acquisition of new knowledge and skills, resulting in increased social status in the community (Geoghegan and Smith 1996).

Policy, legislative and administrative context

The major national stake holders include the Department of Fisheries, which is responsible for the management of marine reserves; the Forestry Department which is responsible for forest and wildlife management on government lands; the St. Lucia National Trust (SLNT), the country's lead organization in the conservation of natural and cultural heritage and the National Development Corporation (NDC), the agency

responsible for Governments lands and slated for eventual development and legal owner of Mankote (Geoghegan and Smith 1996).

The need for legal provision of cutting rights for the existing subsistence-level charcoal producers was first noted in 1981 and began to be generally accepted around 1990, but did not actually occur until 1996, and then only in the form of a letter from the Deputy Chief Fisheries Officer. During much of that time period, insecurity of tenure had negatively affected the charcoal producers commitment to the management regime and their efforts at group formation (Geoghegan and Smith 1996).

The main legal instruments governing forest use and management are the following:

- The Forest, Soil and Water Conservation Ordinance of 1946, amended in 1956 and 1983. It stipulates the conditions for timber harvesting, makes provision for control of squatting and defines other offences.
- The Wildlife Protection Act of 1980 places authority for wildlife legislation in the hands of the Minister of agriculture, and makes provision for the conservation and management of wildlife, through the listing of species, the establishment of reserves, and the setting of fines for offences.
- The Crown Lands Ordinance of 1946 establishes the position of Commissioner of Crown Lands and sets the conditions for the management of Crown Lands.
- The Land Conservation and Improvement Act of 1992 establishes a Land Conservation Board and gives it a broad mandate with respect to the management of land and water resources.

The Government is also party to other international conventions which provide additional support to national policies governing natural resource management:

- The International Convention on the trade of Endangered Species;
- The Convention on Desertification;
- The World Heritage Convention;
- The Convention on the Protection and Management of the Coastal and Marine; environment of the Caribbean, (Cartagena Convention)

Conclusions of the Project

Since the implementation of the project in the 1980's, the overall trend of degradation of the tree cover has been reversed. The conditions behind this reversal are ascribed to the shift from an open access policy to a communal property regime. That is the wood products of an area that used to be freely open to all potential users is now used mainly by an organized community of a limited number of charcoal producers. The more secure resource use rights of the charcoal-producers precipitates a change in behaviour and attitude. Instead of cutting wood indiscriminately, the security of tenure makes it possible to cut with more care and conserve for the medium and long term. The major lesson from the case study is that integrated conservation-development projects have good potential to be effective if they can lead to the avoidance of open-access conditions, and to specification of property rights (Smith and Berkes 1992).

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