

INCENTIVE MEASURES

Recommendation VII\9 of the seventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) to the Convention on Biological Diversity invites the Executive Secretary to gather information on perverse incentive, as well as case studies and best practices on incentive measures and their implementation.

Perverse incentives as described in the document (UNEP/CBD/SBSTTA/7/11), induce unsustainable behavior that reduces biodiversity. They can include government subsidies or other measures, which fail to take into account the existence of environmental externalities, as well as laws or customary practice governing resource use. The abandonment of perverse incentives can have a positive impact on the conservation and sustainable use of biodiversity.

This category of incentive measures has rarely been applied in the management of biological and natural resources in St. Lucia. However, mention must be made of a particular situation that existed within the Department of Forestry in St. Lucia. The sale of local standing timber was conducted using a **girth-foot limit system**. Up until the last amendment of the Forest, Soil and Water Conservation Ordinance and the regulations that support the forest law which took place in 1983, local timber coming from the government forest reserves was sold at “**a royalty rate.**” The sale of local timber is regulated by what is called a girth-limit. The girth-limit established for the sale of local timber is five (5) feet at breast-height (1.3 meters). From the inception of the first piece of forest legislation and regulations - the Forest, Soil and Water Conservation Ordinance (1946), the sale of local timber occurred through subsidies. This allowed for local wood-sawyers, farmers, furniture-makers and private individuals to purchase several timber trees over a short time period within the natural forest eco-system. This has definitely contributed to the loss of forest biodiversity and impacted negatively on the various forest ecosystems and watersheds.

The sale of standing timber at the royalty rate was discontinued in 1987. Timber has since then been sold at cubic foot content and the price per cubic foot was revised to reflect market value of rough lumber. As a result of this change in price of standing timber, the purchase of local timber has been reduced tremendously. The above case in which timber was being sold at royalty rates led to the rapid exploitation of key canopy timber species and co-dominant tree species. This has impacted negatively on the habitat of the St. Lucia parrot (*Amazona versicolor*) and other canopy species. The sale of trees by cubic foot (by volume approach) and the revision of the girth-limit from five (5) to eight (8) feet, which applies to local timber, has slowed down the purchase of local timber and as such has enhanced the management of the forest biological resources.

Another situation in which perverse incentive measures were applied was in the management of the fisheries sector in St. Lucia. Sea turtles have traditionally been

exploited for their meat and eggs. A turtle fishery existed in St. Lucia until a recently imposed moratorium on their capture was implemented in March of 1996 (National Report for St. Lucia; First CITES Wider Caribbean Hawksbill Turtle Dialogue, Mexico City, 15-17 May 2001). The moratorium was instituted based on global and local concerns for declining trends in both turtle nesting and commercial catches over preceding decades. Before the moratorium was instituted, the following regulated the use of the turtle resource: prohibiting the-

- Disturbance, collection, sale or consumption of turtle eggs;
- Disturbance or killing of nesting females;
- Setting of turtle nests within 100m of the shoreline;
- Capture of turtles below species-specific size limits and during a closed season which existed from March 1st through to September 30th each year.

Although, all these prohibitions were in place the turtle resources were on the decline until the moratorium was enforced.

In addition to the two examples of perverse incentive measures presented above, the other three categories of incentive measures which include positive incentives, disincentives and indirect incentives have been applied in the management and conservation of the biological resources in St. Lucia.

Positive incentives are viewed as economic, legal or institutional measures designed to encourage beneficial activities. This category of incentive measures include, incentive payments for organic farming, temporary stipends for traditional fishers, taxation and fiscal measures, agricultural land set-aside schemes or conservation easements. In 1997, the Soufriere Marine Management Area (SMMA) went through difficult times. Two major sources of land-based employment laid off staff, the Jalousie Plantation Resort and the Copra Factory. These actions left a definite imprint on the SMMA and served to illustrate the integral relationship which exists between businesses in Soufriere, the local community and the SMMA. The competition among traditional and “temporary” (out of work) fishers led to an upsurge of undesirable fishing activities in marine reserve areas. The situation was alleviated through a CABINET CONCLUSION 783 of November 6th 1997, through which the Government granted a monthly stipend of four hundred Eastern Caribbean dollars (EC\$400.00 or US\$148.00) to twenty (20) of the original displaced fishers for a period of one year. This was one form of a positive incentive measure.

Disincentives on the other hand are mechanisms that internalize the costs of use/or damage to biological diversity in order to discourage activities that deplete it. Disincentives might include user fees, non-compliance fees, fines for damages, environmental liability, habitat mitigation schemes and marine pollution liability. Also within the SMMA through several discussions with Soufriere fishers, the majority agreed that gillnets were the main culprits accounting for significant damage to coral reefs within the SMM. Thus a joint decision was made to prohibit their use within the SMMA. As a result, nineteen (19) existing gillnets were then purchased from the fishers and effective August 17th 1998, the use of bottom gillnets was prohibited within the SMMA.

There are several other cases or situations in St. Lucia where one or two forms of the four categories of incentive measures have been applied but these are still to be documented. However, the following case studies and best practice agreement or arrangement presented provide sufficient information with respect to the main topic – Incentive Measures.

CASE STUDIES AND BEST PRACTICES ON INCENTIVE MEASURES AND THEIR IMPLEMENTATION

A. 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 eco-tourism 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 re-cutting, 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. People 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 World War II 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 Biodiversity 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 sustainable 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>	

Plants

Scientific Name

Sophora tomentosa
Sporobolus spp.
Cocos nucifera
Sesuvium portulacastrum
Frimbristylis spathacea
Spartina patens
Rhizophora mangle
Avicennia germinas
Laguncularia racemosa
Conocarpus erecta

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 in spite 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. zigzagging to access clusters of suitable stems. All group members are aware of each other's cutting area 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 a few 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 and Objectives of the Benefit Sharing Arrangements

The reasons and objectives for the different actors entering into the benefit sharing arrangement are as follows:

The Mankote mangrove was in decline due to unregulated cutting of mangrove to serve as a fuel-wood (char coal making and fire wood), fishing, spraying of pesticides, cutting of tracks 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 monitoring 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 stashes to allow re-sprouting, 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 fairly 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 fuel-wood. 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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ADJUSTING TO A NEW WAY OF LIFE- Marine Management Areas and Fishers

Dawn D. Pierre

Fisheries Biologist

*Department of Fisheries
Ministry of Agriculture, Forestry, Fisheries and the Environment
St. Lucia*

Introduction

The town of Soufriere, located midway along St. Lucia's west coast, is a picturesque community known for its famous twin volcanic peaks (the Pitons), waterfall (Diamond Falls), drive in volcano (the Sulphur Springs), old growth rainforest and spectacular coral reefs. Soufriere's population stands at 8,500 with about 150 fishers operating here from just over 100 fishing vessels. According to Department of Fisheries statistics, these craft comprise: 51 wooden canoes, 30 fiberglass pirogues, and 35 smaller transoms and 'shaloops'. The fishers are mostly full-time (59 part-time and 91 full-time) and they land over 80 tons of fish annually. In contrast to many of the other fish landing sites, Soufriere's catch mainly comprises coastal pelagics such as jacks, balao and sardines as well as reef species and flyingfish.

Soufriere fishers have traditionally engaged in nearshore fishing, including pot and seine fishing, while fishing communities to the northwest, east and south of the island have become focussed on offshore fishing for migratory pelagics (e.g., tunas, kingfish and dolphinfish), particularly during the first half of the year. Soufriere has been slow to follow this trend due its location furthest from the migratory routes of the valuable pelagics. The significant distance that fishers need to travel to access such resources leads to additional time and operational costs (fuel) and demands investment in high-powered engines and improved gear and methods. Such factors have discouraged the majority of Soufriere fishers from making the transition into offshore fishing.

In addition to the above constraints, Soufriere fishers have had to contend with the rapid growth in the tourism sector, particularly in the areas of yachting, diving, snorkeling and coastal sightseeing. While the benefits of such tourism accrues to the local restaurateurs, hoteliers, taxi operators (water and land based), dive operators, charter boat companies and sightseeing operations, there has been little direct benefit of tourism expansion to the Soufriere fishers. In fact, prior to the formation of the Soufriere Marine Management Area (SMMA), fishers often found themselves in conflict with these visitors: -

- yachtsmen and fishers competed for the use of marine space for both anchoring and seining activities respectively;

- divers were often accused of deliberately damaging fish pots found during dive expeditions, especially in extensive areas that had been declared marine reserves (no-fishing zones) since 1984 but had never been demarcated;
- tourism related vessels were known to interrupt fishing and damage fishing gear by passing too close to fishing activities or passing directly in the path of deployed fishing gear;

Thus, Soufriere fishers seem to have been disadvantaged not only by their location, but also having suffered additional difficulties as a result of tourism expansion. The official establishment of the Soufriere Marine Management Area in 1995 has brought with it several benefits to fishers: representation on the SMMS's technical advisory committee, adjustment of marine reserve boundaries and the establishment of more fishing priority areas catering to the seine fishing activities. Yet the initial disadvantages were far more evident, particularly in loss of many of their prime reef fishing areas. Fishers will need to wait several years in order to benefit significantly from the formation of new, actively protected reserve areas as a "spill over" effect is anticipated, i.e., increased fish production in marine reserves leading to emigration of fish to fishing priority and multiple use areas. In the meantime, fishers have to "feed their families".

Easing the Growing Pains

In an effort to alleviate the constraints faced by Soufriere fishers, largely promulgated by their loss of prime fishing grounds, and help reduce fishing pressure on the nearshore resources, the Government of St. Lucia, through the Department of Fisheries and the Soufriere Marine Management Area, embarked on several initiatives in the Soufriere area: -

A Temporary Stipend for Traditional Fishers

In 1997, the SMMA went through difficult times. The closure of two major sources of land-based employment, the Jalousie Plantation Resort and the Copra Factory, left a definite imprint on the SMMA and served to illustrate the integral relationship which exists between businesses in Soufriere, the local community and the SMMA. The competition among traditional fishers and "temporary (out of work) fishers" led to an upsurge of undesirable fishing activity in marine reserve areas. The situation was alleviated through Cabinet Conclusion 783 of November 6th, 1997, through which Government granted a monthly stipend of EC\$400 to twenty (20) of the original displaced fishers for a period of one year. This stipend supplemented the meager income

of fisher families who were disadvantaged by the increased fishing competition brought about by newcomers.

Based on information obtained from fishers regarding revenue derived from reef fishing, the above figure was considered reasonable. The concept at that time was to discourage fishers from trying to earn a living by illegally fishing in the marine reserves. Any repeat offenders would be fined, their gear confiscated and the stipend stopped. It was also the intention that the Government of St. Lucia and other relevant agencies would seek to find or create alternative opportunities for the non-fishers who had lost their jobs. Fortunately, both the Copra Factory and the Jalousie Hotel re-opened prior to cessation of the stipend alleviating the pressure on the nearshore resources.

Selective Access Granted to the Grand Caille Marine Reserve

Due to the perceived “marginalization” of the traditional fishers through the active protection of most quality reef areas (as marine reserves) and then as a result of the competition among traditional fishers and newcomers temporarily out of work, selected dependent pot fishers were granted limited fishing access to the southern half of the Grande Caille Marine Reserve. This was done via Cabinet Conclusion No. 947 of December 4th, 1997. As a result of the destructive nature of bottom gillnets, the latter were not to be used in the said area. In addition, upon the request of the fishers who strongly felt that marine reserves should in fact be left completely undisturbed, diving and snorkeling (which are usually allowed within marine reserves) were prohibited in the Gros Piton Marine Reserve, with only authorised research being permitted.

Fonds Francias pour l' Environnement Mondial (the FFEM Project)

What is the FFEM about?

The FFEM project is an initiative between the Government of St. Lucia and France that focuses specifically on conservation and sustainable use of marine resources in the Soufriere district. The following sub-projects have been conducted, with financial assistance from the French Government: -

Construction of a Jetty

Upon the request of the fishers, a jetty was constructed in 1998 near the filling station in

Soufriere in order to facilitate direct fuelling by fishers prior to fishing expeditions. The

jetty also facilitates off-loading following fishing trips, since it is located in close

proximity to the fish market. It was felt that, should more fishers invest in larger

fiberglass pirogues for offshore fishing, a jetty and market facility would be required for landing and selling their catches.

Gillnet Buy-back Scheme

In previous discussions with Soufriere fishers, the majority agreed that gillnets were the main “culprits” accounting for significant damage to coral reefs within the SMMA. Thus a joint decision was made to prohibit their use within the SMMA. Nineteen (19) existing gillnets were then purchased from fishers and effective August 17th, 1998, the use of bottom gillnets was prohibited within the SMMA.

Provision of an Ice Machine

Access to ice is a significant problem facing fishers islandwide, where catches of coastal pelagic fish species (such as jacks, balao and sardines) can be unpredictably large. This “handicap” causes unnecessary wastage and loss of income to fishers due to poor prices during glut periods. Upon the request of the fishers of Soufriere, an ice machine was purchased for fishers which now can facilitate the temporary storage of fish. Such a facility will also be a valuable asset for dealing with bumper catches from the highly seasonal offshore pelagic fishery, should this become a focus for some of the vessels.

Introduction of Fish Aggregating Devices (FADs)

In a continued effort to enhance fish catches and, in particular, to encourage west coast fishers to change their focus to offshore fishing, the Department of Fisheries with the involvement of local fishers, built and deployed several Fish Aggregating Devices (FADs) off the west coast of the island.

FADs are designed to act as fixed shelters for migrating pelagic fish, thus reducing the time and cost of hunting for fish offshore. Small fish are known to congregate around FADs in search of food and shelter and larger predatory fish are then attracted to the FADs. These structures have been particularly successful in encouraging traditional nearshore fishers to engage in offshore fishing and have also provided as source of offshore fish catch during the second half of the year when the migratory pelagics are

scarce and fishing effort has tended to focus on nearshore demersal fish species such as reef fishes.

The fishers of Soufriere have been obtaining large catches from their FAD and have requested that additional ones be deployed in the area. A earlier FAD had been deliberately destroyed by fishers as result of insufficient public awareness activities prior to deployment. However, with the recent approach and enthusiasm over the current FADs it is hoped that these structures can continue to ease fishing pressure on the nearshore.

An Investment Fund

This fund was devised so as to assist fishermen in obtaining loans for engaging in activities other than coastal demersal fishing (e.g, deep sea fishing activity, tourism-related activities). Fishers are provided a grant comprising 20% of the funds required for an investment, but the amount granted must not exceed EC\$6000. A number of fishers have submitted projects for this form of assistance, but funds have not yet become accessible.

Other Assistance

The FFEM project has also helped in a number of other ways less directly related to the fishers: - construction of an office for the operation of the SMMA; provision of training in accounts for SMMA staff; purchase of office, dive equipment and souvenir items for sale at the SMMA shop; provision of equipment for monitoring of the marine

environment; supporting community activities such as sponsorship of the local basketball team and carnival band; sponsorship of a “kids safari” environmental education programme; funding of a small-scale watershed management programme; and funding of an institutional review process for the development of a more effective and efficient SMMA.

Longline Training

A Long-line Training Project was devised and implemented during the first quarter of 1999. This provided the opportunity for Soufriere fishers to learn to construct and operate tuna long-lines suitable for long-lining vessels and the larger pirogues. The project, funded by the French Government, is to extend over a two-year period and caters to fishers island-wide. Initially, the project focused on Soufriere fishers to enable traditionally near-shore fishers to acquire theoretical and practical skills for offshore fishing in hope that a change of focus might reduce the level of over-fishing on near-shore reef resources.

Where we Stand Now

Despite the setbacks commonly associated with the establishment of marine parks and marine management areas, the formation of the SMMA has been very beneficial to the Soufriere community and St. Lucia as a whole. These benefits include:

- Resolution of conflicts among users through a consultative and participatory process leading to apportioning access of the coastal zone; this has facilitated the more harmonious coexistence of users and will likely increase economic activity over the longer term through the conservation and sustainable use of resources and more equitable sharing of benefits.
- Improvement in the status of coral reefs, especially branching corals, through the provision of mooring buoys for yachts and dive boats; previously these corals suffered physical damage particularly from anchorage (Roberts et al, 1997).
- Increase in fish stocks in marine reserves and fishing priority areas (Roberts et al 1997). The annual fish census indicates that fish biomass in marine reserves has increased significantly and in some cases has as much as tripled.
- Collaborative management of the area through the formation of a multi-sectoral technical advisory committee (TAC) comprising users, as well as relevant

governmental and non-governmental agencies; this has created greater ownership of the SMMA initiative and facilitated broad-based involvement in management of the resources of the area.

- High awareness about coastal marine management issues through the efforts of the SMMA, Department of Fisheries and other associated groups.
- Provision of a valuable area for scientific study because of the presence of congruent marine reserves, multiple use and fishing priority areas; this value is complemented by the unique process leading to the establishment and management of the SMMA;
- Increased use of the SMMA by yachters and divers, generating income for the SMMA (through user permits) and for the Soufriere community at large (e.g., through visitors patronizing local bars and restaurants and purchasing handicraft items)
- Support to community activities, such as sponsorship of a local basketball team and carnival band, fishermen's feast;
- Capacity building for previously poorly organized groups, facilitating a more viable business environment e.g., the case of the Soufriere Water Taxi Association.
- Generation of user fees, and "friends of the SMMA" foundation led to near self-sufficient financing of the marine area management.
- International recognition for conservation efforts by the SMMA, which received the 1997 British Airways Tourism for Tomorrow IUCN Special Awards for National Parks and Protected Areas.

Conclusion

It is clear that the aspect most difficult to accept with respect to marine management area establishment has been the formation of marine reserves. This is especially so for fishers, who lose prime fishing grounds and must wait several years for benefits of the reserves to accrue.

In the case of the SMMA, the increase in fish stocks is already evident within the unfinished populations but does not yet appear evident within fish landings from fished zones. Thus, the gains made to date are still weak and are heavily dependent on a complete lack of fishing in reserves and a reduction in the degree of nutrient and sediment being released into the marine environment from anthropogenic land-based sources.

In 1997, the widespread violation of marine reserve regulations was reflected in fish abundance, where the number and biomass of fish in two long-standing marine reserves fell compared to 1996. If rules are not adhered to and the marine reserves are not respected, all efforts will go to waste. It is with this in mind that the Government of St.

Lucia has procured such an array of activities focused on assisting the displaced fishers during the period of transition, until the benefits of the reserves become evident to this group.

