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Integrated Management of Common Property Fuelwood Resources from Natural and Plantation Forests in St. Lucia

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Introduction

The need to integrate better the interests of local people into the management of forests is viewed increasingly as an indispensable part of the solution to conserve these resources (Falconer, 1987; Shepherd, 1986). Community forestry, one of the most promising of such people-centred approaches, involves the planting of trees and the management and use of forest resources on common lands by the local forest users themselves. This case study describes a project from St. Lucia, West Indies, involving a community-based approach to mangrove conservation and fuelwood plantation management.

Project Identification and Rationale

The Eastern Caribbean Natural Area Management Programme (ECNAMP), now the Caribbean Natural Resources Institute (CANARI), under the auspices of the Caribbean Conservation Association (CCA), identified in 1981 the southeast coast of St. Lucia as a priority for conservation in the Lesser Antilles (Fig. 1). Mankòtè, a relatively large (150 acre) basin-type mangrove, was identified as particularly significant in the area in terms of its ecological importance and economic uses, some of which then threatened its conservation. For example, local households and businesses used the mangrove indiscriminately to dump domestic garbage and industrial wastes, and a nearby tourist hotel had requested and convinced the Ministry of Health to undertake a mosquito eradication programme involving clearing, draining and spraying large areas of the mangrove. However, by far the most significant use of the mangrove was charcoal production, both in terms of local economic importance as well as potential ecological impact.

Charcoal is the single largest source of domestic cooking fuel used in St. Lucia, and is particularly important for rural, lower income households. (Romulus,1987).

The Mankòtè mangrove is the preferred cutting site by most local charcoal producers because mangrove wood makes good charcoal, the supply of wood is abundant and grows back quickly after cutting, and producers are able to sell their entire production, whereas production from private lands must be shared with the landowner. At least nine different charcoal producers were known to use the Mankòtè mangrove as their primary cutting site in 1981 (Vieux Fort Senior Secondary School, 1981), although this may well be an underestimate as later numbers were much higher (Romulus, 1987) estimated 21 producers). These producers operated independently or in small family groups, utilising the traditional production technologies of cutlass and earth pits, and selling their coals in nearby villages. The Mankòtè mangrove was by far the single largest source of locally-produced charcoal for the greater southeast coast/Vieux Fort area.

It was clear at the time of project identification that existing levels of cutting for charcoal production posed a serious threat to the mangrove. All large mangrove trees had been cut and localised areas were completely denuded of trees. In addition, evidence suggested that harvesting rates in the mangrove were likely to remain high or even increase as other local supplies of fuelwood were being exhausted (Vieux Fort Senior Secondary, 1981).

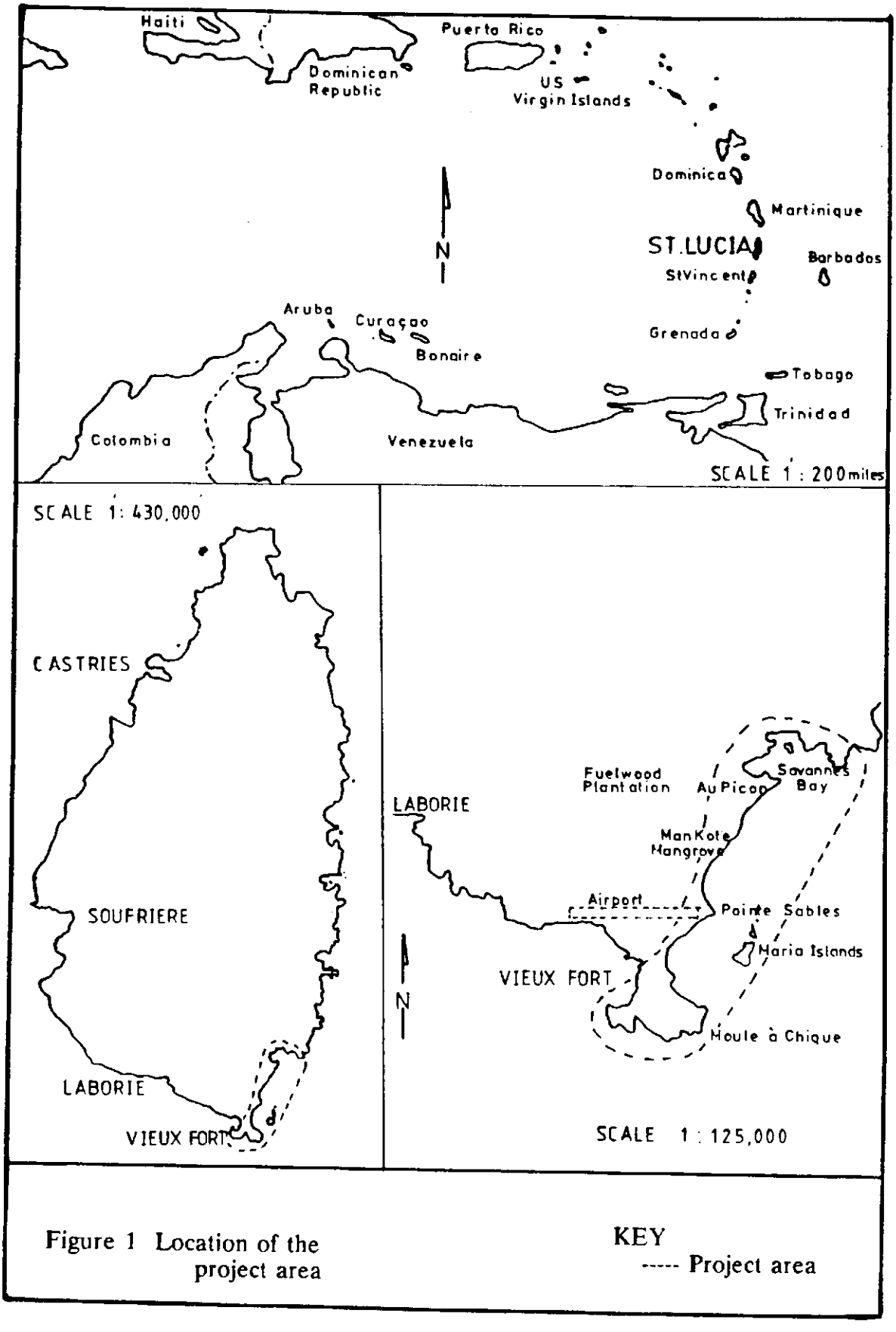

Figure 1 Location of the project area

Resource Tenure and Institutional Context

The southern region of St. Lucia has a long history of externally driven, rather than self-directed, development which has had important implications for land and resource tenure (ECNAMP, 1983). Prior to the Second World War, most of the good agricultural lands in the region were privately held in large plantations for growing cane. Private tenure under the plantation system was clearly defined. The use of the land and the conditions of use were similarly clear. The Mankòtè mangrove, which was part of the Bellevue Estate, was used as a source of fuelwood for the estate and later for export to Barbados (ECNAMP, 1983).

This system was totally disrupted by the leasing of vast portions of these same private lands (including the mangrove) to the United States for the establishment and operation of a military air base from 1941-1960 (Jesse and Easter, 1971). Access to the mangrove was seriously restricted during the War period (1941-1946), although informal use for charcoal production and other activities commenced shortly thereafter as the U.S. military presence gradually receded from the area (Y. Renard, pers. communic.).

Following the closing of the air base in 1960, these lands were transferred to the government of St. Lucia. While much of the original air base infrastructure has been retained and developed to accommodate the present international airport, considerable peripheral lands, including the mangrove, have since been placed under the jurisdiction of the National Development Corporation (NDC), a government statutory body. Some of these lands have since been utilised for industrial park development schemes, but a significant area has remained undeveloped. In practice, large portions of these undeveloped lands exist in a relatively open access that is, no effective control over the use of the resource. These lands are in a highly degraded condition and used extensively for grazing animals, collecting wood, dumping garbage and wastes, and, more recently, illegal farming and settlement. Squatting, for example, has become an acceptable housing strategy in the area since indiscriminate and illegal uses of land have not been seriously discouraged.

The Mankòtè mangrove was in some ways similar, and in other ways exceptional, to this general use of these public lands. On the one hand, the mangrove was widely used as a dumping site by local households and businesses, and the decision to implement an extensive mosquito eradication programme there would suggest little regard by government for the productive values of this land. On the other hand, however, investigations revealed that the mangrove was used extensively by locals for a variety of potentially sustainable purposes, including charcoal production, seasonal fishing, crab hunting, grazing, and therapeutic bathing. Unlike use of much of the neighbouring public lands, however, the use of the mangrove--at least for some activities--appeared to be regulated to a certain extent by the community of users.

For example, while cutting levels in the mangrove appeared to be unsustainable, the charcoal producers did, in fact, implement practices which reduced the harvesting impact on the mangrove and improved its regenerative capacity. Among these practices were selective cutting and leaving the base of the mangrove tree to allow for regrowth. In addition, family groups had established informal boundaries in the mangrove to define cutting areas (Vieux Fort Senior Secondary, 1981).

It was discovered, however, that the level of cutting had recently deliberately increased, in part due to the charcoal producers' perception that they were soon to lose access to the mangrove. In other words, while it is difficult to evaluate the effectiveness of the informal tenure and management system that was in place, it is clear that the increasingly unregulated harvest in the mangrove was fostered by threats of government intervention on that informal system.

ECNAMP personnel agreed that the key to successful mangrove conservation under these circumstances was to involve the local resource users in the management and protection of the mangrove, in particular the charcoal producers. Unfortunately, however, the producers were socio-economically very marginal and, therefore, in no position to make short-term sacrifices to conserve a resource that they had no assured access to over the long run. If adequate development opportunities for the producers could not be made part of the conservation of the mangrove, then sufficient alternatives would have to be provided to ensure their support and participation in the project.

Project Goals and Objectives

The overall goals of the project were to ensure the protection of the Mankòtè mangrove while simultaneously providing the local resource users--especially the charcoal producers--with maximum opportunities for socio-economic benefits derived from the sustainable use of the mangrove and other alternative resources. Due to the then novelty of the idea, an important secondary goal was to use the project as an experiment in community-based management and demonstration model of linking conservation with local-level development (ECNAMP, 1983).

The project initially entailed two major components, both based on the constitution of the independent charcoal producers into an organised group. The objective of the first component was to establish a 25 acre fuelwood plantation of fast-growing *Leucaena leucocephala* over 5 years at 5 acres per year on public (NDC) land adjacent to the mangrove near the village of Aupicon. The Forestry Department (previously known as the Forestry Division) assumed principal responsibility for overseeing the implementation of the plantation component of the project. The goal of the plantation would be to provide the charcoal producers with a significant alternative source of fuelwood to the mangrove for making charcoal. At the same time, the goal of establishing community-based management over the plantation would be achieved by involving the charcoal producers as much as possible in the establishment, management and use of the plantation.

Secondly, efforts were made to improve the existing use and management of the Mankòtè mangrove by the charcoal producers with the primary goal of conserving the mangrove (the "Mankòtè" component). In this case, community management would be facilitated by maintaining or enhancing traditional patterns of resource use whenever possible. A secondary, but nonetheless important, goal of this component was to provide opportunities for scientific research and public education on the ecological, economic and cultural values of mangroves.

A third component evolved later on in the project when it was realised that the plantation was not going to live up to its expectations as an adequate alternative source of income for the charcoal producers (Walters and Burt, 1991). Following suggestions from the producers, NDC land adjacent to the *Leucaena* plantation was obtained on lease and used in 1987 and onward for a community vegetable garden with the goal of providing the charcoal producers with an additional economic alternative to charcoal production in the mangrove. The so-called "agricultural component" assumed considerable importance during the years 1987-1990 (see Case History in Appendix 1), but CANARI's role in it is being phased-out.

Discussion and Lessons Learned

Problems associated with the management of communal resources are the primary constraint to sustainable community forestry (Falconer, 1987). Such problems usually reflect existing institutional limitations and, therefore, any project aiming to support or develop community-level management must change existing institutional capabilities.

1. Social (community) development should be viewed as a goal in itself. The social benefits derived from collective action may contribute significantly to institutional sustainability.

Measuring social goals is difficult but essential for evaluating community-based development, particularly when the target of such development is, as in this case, a marginal socio-economic group. The lack of inherent social cohesion among charcoal producers has unquestionably hindered the project. The other side of this coin, however, is that the project appears to have benefitted the charcoal producers considerably in terms of their social development (Koester, 1989). For example, the project has attracted considerable attention to the group from the wider community, which is significant considering the traditional low status of charcoal producers. The group now functions well and participation at weekly meetings is high and democratic, a reflection of the general view among producers that group activities such as meetings are a meaningful and enjoyable experience. Members have also regularly served as teachers to demonstrate the project and to share their skills as charcoal makers to visiting students and other professional groups.

2. Local knowledge and expertise are a valuable source of practical information and skills that should be utilised fully in all aspects of community-based development.

The use of local knowledge (eg. charcoal producers' knowledge) and local expertise (eg. charcoal producers, school groups, visiting scholars and university students) greatly facilitated research and information collection and documentation, particularly with respect to understanding mangrove ecology, local socio-economic conditions, and resource use patterns. It was found, for example, that charcoal producers were very knowledgeable about management techniques intended to conserve the mangrove. What was generally required, therefore, was not the introduction of novel management tools or methods, but rather the incentive to make the producers want to conserve the mangrove resource by using familiar instruments.

3. Existing social priorities and characteristics of the target community should be reasonably compatible with the level of co-operation and collective action required for the proposed community-based development.

There are unusual socio-economic factors which make novel technical and institutional development with the charcoal producers particularly precarious (Carnegie, 1987). In the first place, the charcoal producers are characterised by a long history of short-term, opportunistic and individual-oriented work. Among other things, this means that the number of active (particularly part-time) producers varies considerably over time depending on the availability of alternative employment and changing demands for charcoal. In addition, the producers are of mixed racial origin and relatively recent immigrants to the area, and therefore lack strong wider community cohesion. Combined, these factors create major barriers to effective group cooperation.

4. Project responsibilities of the implementing agencies and the target community must reflect within reason each one's existing institutional capabilities.

This project has demonstrated that institutional change does not come easily, and may not come at all, if the inertia to resist change is too strong. Project responsibilities must, therefore, reflect within reason existing institutional capabilities. For example, the Forestry Department lacked the institutional capability (past experience, appropriately trained personnel, appropriate technologies, and so forth) to successfully implement a community managed plantation.

The institutional approach selected for establishing local-level management suffered from similar difficulties. From the outset the project has sought to establish some form of group decision-making and cooperative management over the fuelwood and mangrove by the charcoal producers. This has been a challenging task, one that has been much hindered by the fact that collective management is novel to the charcoal producers.

There have been some successes, nonetheless. For example, the core group has established itself with well-attended weekly meetings and effective consensus decision-making at those meetings. In addition, they appear to view the project as "their" project, suggesting that they have not been overly alienated from past mistakes. Waste dumping and other indiscriminate uses of the mangrove have also been reduced, it is believed, in part, because producers perform some informal policing of the area. Finally, some success has been met with the use of traditional, voluntary cooperative work parties, called koudmen in Creole. By-and-large, however, the level of collective involvement in management activities has been low, and it is widely acknowledged that the lack of past cooperative experience is central to this.

5. It is advisable to build upon existing management mechanisms and institutions as much as possible, rather than introduce novel ones.

Even in the best of circumstances, it is considered wiser to strengthen existing management practices and institutions where they exist, rather than attempt to develop totally new ones (Falconer, 1987; Shepherd, 1986). The greatest successes have been met in this case where existing management systems and institutions formed the bases of novel activities.

The koudmen, named above, is one example. The strengthening of existing management mechanisms within the mangrove is another.

6. Clear community definition is important for collective action. Development activities must, therefore, strengthen the community's "functional link".

Cooperation has been hampered somewhat by a lack of clear community definition. In short, not every mangrove charcoal producer also works in the vegetable garden; not every mangrove producer also works in the plantation; and not every vegetable farmer also works in the plantation. As indicated earlier, one reason for this lack of definition is the nature of charcoal making as a subsidiary and occasional source of income for some, whereas a principal and regular source of income for others. Full- or near full-time producers obviously have a greater vested interest in conserving the resource and exploring alternatives, and they are more likely to keep abreast of the organisational activities of the group. The "core" of the charcoal producers' group has, in fact, been comprised of these regular producers who occasionally express concern that other less regular producers may eventually free ride on their labour.

Another important factor which contributed to the lack of community definition was the implementation of the agricultural component, which resulted in considerable tension between some group members and caused others to leave the group entirely. Individual members had strikingly different propensities to farm, with the result that some became alienated from the original charcoal producers' group and thus excluded from wider institutional efforts to manage the mangrove and plantation.

7. Community-based development should be well integrated into the wider village community, even if the target of the project is a specific subset of that community.

Greater effort should have been made to incorporate other members of the wider community into the project to share in its benefits. There are several reasons for this. First, the incorporation of additional, interested community members directly into the project may have provided the leadership and cooperative initiative that was so lacking among the charcoal producers. Second, expanding membership could have facilitated the project's impact on the wider community as a model of community forestry. Third, stronger integration into the wider community could have better served project goals, for example, by creating additional peer pressure on the charcoal producers to assume greater responsibility for the project, and by further sensitizing and encouraging more rational use of the resource by other community users (eg. people who fish or dump garbage in the mangrove). Finally, there is some indication that the bush fires which did considerable damage to the plantation in 1985 and 1987 were the result of arson by members of the wider community (see Appendix 1). Perhaps these would have been avoided if the wider community had been more involved in the project.

8. External assistance to a community based management effort may reduce the commitment of beneficiaries to the protection of the resource.

Greater efforts should have been made to encourage the charcoal producers to ensure adequate protection of the fuel wood seedlings in the community woodlot. The Forestry Department had supplied the seedlings and finance for labour as well as some labour for planting. Lack of vigilance caused destruction of part of the plantation by fire in 1985 and 1987 and by stray goats in 1989.

9. Effective common property management is more likely to develop when communal users perceive the resource as both valuable and scarce.

The charcoal producers unanimously agree that the mangrove is the single best available source of fuelwood for them, in part because mangrove wood makes good charcoal, but more importantly because it is the last significant source of fuelwood in the area. As such, they share a vested interest in conserving and maintaining access to it. The presence of informal family cutting zones and environmentally sensitive cutting techniques demonstrates this. In addition, some producers actively restrict access by outsiders wanting to cut in the mangrove.

At the same time, planting valuable fuelwood trees on the previously degraded and unproductive public lands at Aupicon has resulted in a level of management previously unknown to the area. For example, producers now attempt to keep stray goats away from the plantation area and have restricted general road access through the construction of a gate. In one sense, what is being observed at Aupicon is a gradual transition away from

open access conditions over degraded lands towards common property management of a valued resource. It is probable that the site will be even more stringently managed once the producers have obtained more formal rights to the area and more of the fuelwood trees have grown to a harvestable size.

10. Security of community tenure over resources is essential to ensure full community participation in resource management and conservation.

The group must be provided with some formal security of tenure to both the woodlot and the mangrove. While members appear to perceive the project as "theirs", and commonly voice the belief that so long as they make use of the land it is theirs to keep (at least the plantation and agricultural lands), the uncertainty over tenure is unquestionably real and will continue to act as a major barrier to full commitment and participation in the management of the forest resources (Shepherd, 1986). The producers remain unconvinced, that contributing one day free labour to woodlot maintenance for every four days paid by the Forestry Department, is a worthwhile investment in light of the uncertainty over long-term woodlot tenure.

11. Management responsibilities must be determined and clearly understood as early as possible by all players. This is especially critical for the establishment of local community responsibility.

Management plans for the plantation and mangrove which clearly spell-out the sharing of responsibilities between the Forestry Department, CANARI, NDC, and the charcoal producers, must be developed and implemented. As long as management responsibility remains vague, it will continue to fall onto the laps of the Forestry Department and CANARI. The Forestry Department, for example, has always assumed principle responsibility for the establishment and management of the woodlot, with active local participation limited to the occasional hiring of labour from the local producers when additional funds were available. The failure to include adequate local participation from the outset appears to have had serious consequences in terms of low group initiative and responsibility for ongoing management of the woodlot.

A much stronger management base already exists for the mangrove in terms of traditional and new practices. However, there is still a need to strengthen the overall level of user cooperation and formal responsibility over management of the mangrove. Since charcoal production is often an occasional occupation, external socioeconomic conditions could change in a manner that leads to increased harvesting pressure on the mangrove. An effective management system is the only buffer to external changes; if none is in place and conditions change for the worse, then cutting may once again seriously threaten the mangrove.

It is impossible to assess the community potential of the project until all important decision-making is vested in the community (Falconer, 1987). Particularly important, therefore, is the transfer of most management responsibility for the woodlot and the mangrove away from the Forestry Department and CANARI to the charcoal producers. Emphasis in the management plan should be placed on developing and strengthening further the producers' traditional management of the mangrove. Woodlot management should emphasise building upon whatever cooperative foundations already exist or have been developed and utilised successfully thus far (eg. the weekly meetings and the use of traditional koudmen, as well as a formal understanding of the distribution of economic benefits from the woodlot among the producers).

12. Community management, although preferable, may be inappropriate in situations where other informal mechanisms for regulating resource use already exist (eg. individual privatisation).

If these measures still fail to achieve the desired level of community management--that is, if the institutional capacity of the group does not permit effective cooperative management--then the project has two alternatives. The existing charcoal producers community could be widened to include younger, more ambitious group-motivated members in some format; for example, a co-management system involving the producers' group and an already existing community group. Alternatively, the management approach could be restructured to build more around the traditional, individual-oriented strategies of the producers; for example, by establishing clearly defined individual cutting areas in both the mangrove and woodlot.

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Appendix 1: Case History

The following section summarises the critical events in the history of the project in chronological order. Information to compile this chronology was obtained from a variety of internal documents and from interviews, as well as from the authors' personal experience of more recent events.

pre-1939

The Mankòtè mangrove is part of the Bellevue sugar Estate. Wood from the mangrove is cut for estate fuel consumption and export to Barbados.

1941-1946

Mankòtè is used by the U.S. military as a site to camouflage aircraft and dump garbage. Access is restricted and no cutting takes place.

post-1946

Mankòtè is used by local charcoal producers to supply fuelwood to nearby towns, especially Vieux Fort. The mangrove continues to be used as a local dumping area for domestic garbage and industrial wastes, as well as a site for cattle grazing and pig rearing.

1979-1981

A youth agriculture project is undertaken at Aupicon adjacent to the future Aupicon fuelwood plantation site. While this project disbands before the Mankòtè-Aupicon project commences, it clearly serves as an inspiration to the charcoal producers to enter into agriculture production later on (1987).

1981

The Ministry of Health, at the request of the nearby Halcyon Days Hotel, initiates a mosquito eradication programme involving extensive spraying and some clearing of the mangrove.

The Eastern Caribbean Natural Area Management Programme (ECNAMP), on behalf of the Caribbean Conservation Association (CCA), undertakes an extensive survey of the Lesser Antilles and identifies the southeast coast region of St. Lucia, including the Mankòtè mangrove, as a priority site for conservation.

ECNAMP, with Y. Renard as principal consultant, is enlisted by the National Trust and government of St. Lucia to study the conservation and development requirements of the southeast coast region. An inter-departmental advisory committee is established to oversee the project.

A group of students from Vieux Fort Senior Secondary undertakes a survey of the charcoal producers using the Mankòtè mangrove.

1982

ECNAMP and the school students initiate discussions with the Mankòtè charcoal producers, the Forestry Department of the Ministry of Agriculture, and the National Development Corporation over the use of the mangrove and opportunities for ensuring its conservation. Recommendations are formulated and presented to the Ministries of Planning and Health, with students attending the meeting with the Ministry of Planning.

Consultant A.H. Smith undertakes a preliminary biophysical survey of Mankòtè.

The Forestry Department with funding from the Organisation of American States (OAS) initiates a fuelwood plantation programme in St. Lucia.

A decision is made between ECNAMP and the Forestry Department, in agreement with the charcoal producers and the National Development Corporation (NDC), to establish a fast-growing fuelwood plantation to provide the charcoal producers with an alternative source of fuelwood to the mangrove.

ECNAMP and the Forestry Department negotiate with NDC for the lease of 25 acres of land in nearby St. Urbain (Aupicon) to serve as the fuelwood plantation site.

A plan is determined to plant 5 acres of fast-growing *Leucaena* trees per year for 5 years on the Aupicon site.

The Ministry of Health agrees after discussions with ECNAMP to halt the mosquito eradication programme in the mangrove.

1983

The Forestry Department fences the 25 acre plot undertakes the first planting of *Leucaena* trees at Aupicon, with charcoal producers hired as labourers.

1984

The Forestry Department undertakes the second planting of *Leucaena* trees at Aupicon, with Forestry Department personnel carrying out the planting. Planting takes place undesirably late in the rainy season. ECNAMP and the charcoal producers are dissatisfied that local users are not involved with the planting.

1985

The Forestry Department undertakes the third planting of *Leucaena* trees at Aupicon, with some interplanting of West Indian and Honduran Mahogany and Caribbean Pine.

A surface fire destroys some seedlings.

Leslie Charles is hired by ECNAMP as the Aupicon project officer to initiate greater organisation and participation of the charcoal producers and to facilitate coordination of the overall project.

A monitoring programme of the Mankòtè mangrove (including tree transects, water quality and litterfall) is initiated by ECNAMP as part of the mangrove conservation component of the project.

1986

Charcoal producers meet to discuss the concept of forming a producers' co-operative.

By-laws for the group are drafted and the Aupicon Charcoal and Agricultural Development Group (ACADG) is formed with 14 initial members. Bi-weekly meetings are convened.

ECNAMP and the ACADG participate in a regional meeting of *Leucaena* project co-ordinators.

ACADG formulates a request to the NDC for agricultural land adjacent to woodlot, but there is no reply.

A trial marketing of charcoal in supermarkets is undertaken.

The Mankòtè mangrove is designated a Marine Reserve under the Fisheries Act, as are all other mangroves in St. Lucia.

Leucaena in the woodlot are measured by the Forestry Department to evaluate growth rates.

Annual woodlot planting as originally proposed is not done.

A decision is made by the ACADG to build a dam to supply water for the proposed agricultural garden at Aupicon.

1987

A major fire destroys 5 acres of the plantation seedlings.

Jamaican anthropologist Charles Carnegie evaluates the institutional/organisational alternatives available for the charcoal producers group.

University of the West Indies' student Giles Romulus examines the Mankòtè-Aupicon project as a case study of community-based conservation and development.

A workshop is held involving the Ministry for Community Development, the National Research and Development Foundation (NRDF), and representatives from the Aupicon/Pierrot/Cacao/Morne Caillandre areas to explore wider community development initiatives.

The agricultural component of the Aupicon project assumes prominence and several charcoal producers plant vegetables in a new garden site adjacent to the woodlot at Aupicon.

1988

A delegation led by the Ministry of Agriculture (including the Permanent Secretary) visits the Aupicon project and discusses the relevance and potential of community-based resource management initiatives elsewhere in St. Lucia.

The first dam is constructed.

Much of the agricultural produce from the first planting spoils.

The Forestry Department carries out some maintenance work of the woodlot and plants *Gmelina* and *Cordia* species. ACADG members provide paid labour for planting as well as contribute some voluntary labour.

The project officer Leslie Charles leaves the project.

Internal conflicts lead to general demobilisation and a temporary disbanding of the ACADG group.

The project appears in serious trouble.

1989

Formal partnership for project co-ordination is established between ECNAMP and the National Research and Development Foundation (NRDF). Inter-American Foundation funding is obtained.

Mathias Burt begins as new project officer.

Weekly ACADG meetings are convened. Formal agreements are signed with all members.

A small, on-site tree nursery is established at Aupicon and local varieties of seedlings are planted. Approximately 1200 seedlings are produced.

The agricultural land is ploughed in preparation for planting, but little planting is done resulting in high soil loss from rainfall.

Most of the seedlings in the nursery are destroyed by goats.

3000 *Leucaena* seedlings are planted by the Forestry Department.

A group of students from the University of Puerto Rico visit the Mankòtè-Aupicon project.

The National Youth Council and several local school groups visit the Mankòtè-Aupicon project.

An irrigation system for garden is purchased.

Koudmen involving the charcoal producers and several local groups are used to replant areas of mangrove in Mankòtè and nearby Savannes Bay.

A project storage shed is constructed using mostly hired skills.

1990

The producers' group, with assistance from the Forestry Department, make the first harvest of charcoal from the fuelwood plantation. Serious problems are encountered using a metal kiln provided by the Forestry Department and much of the charcoal is lost; only 24 bags of charcoal are produced from the activity.

A koudmen involving several ACADG members is used to reconstruct the dam to ensure a water supply to the agricultural garden.

The producers' group purchases two power tillers for the agricultural project.

Using another koudmen, the producers construct a gate (to keep out goats) at the Aupicon site.

American anthropologist Stephen Koester evaluates the Aupicon project on behalf of the Inter-American Foundation.

A community forestry workshop is held involving the Aupicon group, CANARI (formerly ECNAMP), the Forestry Department and NRDF.

The Aupicon site is used as a demonstration model. It is attended by a dozen community groups from the south of St. Lucia.

Meetings with the same and additional departments are held and decisions are made to develop a co-management arrangement for the mangrove involving the ACADG. A formal request to cabinet is made for the vesting of the Mankòtè mangrove with the National Trust.

Five Aupicon group members cultivate crops.

The Forestry Department plants 3000 *Leucaena*, 1000 *Casuarina*, and 250 *Gmelina* seedlings at the Aupicon site.

Three agricultural plots realise the production of melon, cucumber, corn, and cantelope.

The Sunshine Harvest Co-operative assists the ACADG to market their produce.

A fish species inventory of the mangrove is initiated.

CANARI is approached by the local Pierrot Youth Organisation (PYO) to initiate a forestry project. A decision is taken to initiate a community-wide tree planting.

News is revealed of a preliminary plan for a major hotel and golf course development that would destroy most of the Mankòtè mangrove.

Cabinet sends a formal letter of refusal for the request to vest the Mankòtè mangrove in the National Trust.

The PYO and Aupicon Development Committee participate in a voluntary tree planting of the local *Gliricidia* species on the Aupicon woodlot.

Bellevue Farmers Co-operative begin negotiations with the ACADG for land on the project site to start chicken and fish farms.

1991

A workshop involving CANARI, the Forestry Department and representatives from several community groups is held to discuss the Aupicon project and three new community forestry initiatives.

The ACADG refuse the offer of the Bellevue Farmers Cooperative to develop agriculture and livestock at Aupicon.

CANARI discusses with the Forestry Department the experimental pruning of *Leucaena* coppices.

Members of ACADG begin clearing land again for spring vegetable planting.

The Aupicon Group is hereby given exclusive rights and responsibilities for use of the land shown on the attached map, as well as the use of the timber and agricultural produce from that land, under the terms and conditions stipulated in this agreement. The Ministry of Agriculture and the National Development Corporation retain the right of access to the land at any time. The Aupicon Group will also grant right of passage to owners and users of land located at the back of the project site.

4. Management activities.

4.1. Harvesting.

Harvesting of the fuelwood plantation will be done by the Aupicon Charcoal and Agricultural Producers Group with the assistance of the Forestry Department whenever necessary. Harvesting can take place at any time during the year, on the condition that the Forestry Department would be given prior notice by the Aupicon Group at least two weeks before the intended date of cutting. Permission of cutting could be refused by the Forestry Department if climatic or other conditions are considered inappropriate. The group will assist the Department in the collection of the necessary data before and after the harvesting. The trees harvested should be no less than 5 centimetres in diameter and no less than 6 metres in height. The Aupicon Group will use the proper method of harvesting which will ensure the continued survival of the trees. The group will decide on the method to be used for the production of the charcoal (metal kiln, pit, etc.).

With regards to agriculture, the group will work closely with the extension officer of the Ministry of Agriculture on pre-harvesting, post-harvesting and marketing of produce.

4.2. Maintenance.

The maintenance of the fuelwood plantation is the responsibility of the Aupicon Charcoal and Agricultural Producers Group, which will ensure that the trees are allowed to grow under the best conditions, that drainage is maintained to prevent erosion and that the general condition of the lands is kept and enhanced. The group also holds responsibility for the maintenance of the fence, gates and other facilities established for the purpose of this project.

4.3. Monitoring.

The Ministry of Agriculture will have access to the plantation to carry out monitoring activities. These monitoring activities will include:

(a) The effectiveness of the various methods of producing charcoal. These methods include the use of metal kilns, earth pits and any other introduced method.

(b) The charcoal yield per tree. From these exercises, it will be possible to determine the amount of charcoal which can be produced from an area felled.

(c) The growth rates of the various species planted will be monitored. The Aupicon group shall be made aware of these activities before their commencement. The group will assist the ministry in its monitoring activities once it has the capabilities to do such.

4.4. Protection and enforcement.

The Aupicon Charcoal and Agricultural producers group will be responsible for the security and protection of all persons and properties within the lands leased. The group will have the right to prosecute anyone who violates their rights as is in the laws of the state of St. Lucia. In the event the group is confronted with a situation which it is unable to handle, the Ministry of Agriculture and the National Development Corporation shall assist in making the necessary representation on behalf of the Aupicon Charcoal and Agricultural Producers Group.

5. Duration.

The present agreement is entered into for an initial period of five , ten ??? years. It can be modified at any time with the consent of all three parties.

In the event that the management procedures described in section 4 above are not adhered to by the Aupicon Group, the Ministry of Agriculture and the National Development Corporation will be entitled to serve a notice to the group giving it a firm deadline for complying with the terms of the agreement. The deadline should not be less than three months. In the event that the Aupicon Group has not complied with these terms at the expiration of the deadline, the Ministry of Agriculture and the National Development Corporation will be entitled to terminate this agreement.

Signed:

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Minister of Agriculture Chairman, N.D.C.

President, Aupicon Group