
Caribbean Natural Resources Institute

A Guide to Teaching Participatory and Collaborative Approaches to Natural Resource Management

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1. Introduction

This guide for instructors uses the case of the Mankòtè Mangrove in St. Lucia to illustrate key lessons about participatory and collaborative approaches to natural resource management. The case was selected because it offers several useful examples of approaches to, and methods for, participatory and collaborative natural resource management. The case shows how economic and other human activities can be reconciled with conservation imperatives and has used a wide range of techniques for participatory decision-making and local institutional development. It is one of the few successful collaborative management arrangements in the region.

This guide presents the main elements of participatory and collaborative approaches to resource management. It can, however, be adapted by instructors for use with students in a range of natural and social science disciplines, including resource management, sociology, economics, and development studies. The material presented in this document is appropriate for use with junior and senior level university students and practising natural resource managers. It is suitable for use in the classroom and in situations where field trips to mangroves can be organised.

The guide is intended for use with the companion case study, *Conservation and sustainable livelihoods: collaborative management of the Mankòtè mangrove, St. Lucia*. The case study and guide are based on the ongoing participatory management arrangement for the Mankòtè mangrove in St. Lucia. The guide and case study are supplemented with a slide presentation and an eighteen-minute video, *Managing together: collaborative and participatory management in the Mankòtè mangrove in St. Lucia* which are designed to give students a visual image of the mangrove and the management issues described in the written documents.

Although there is sequential logic in the presentation of the main elements of participatory and collaborative resource management processes, instructors are encouraged to adapt the guide for their own purposes and chose from the smorgasbord of issues introduced. Each section provides background information for the instructor on a selected issue or set of related issues and uses examples from Mankòtè for illustration. The sections highlight one or more teaching points, around which the instructor may develop lectures or presentations. They also suggest a list of key concepts that are important for comprehension of the theme or set of themes, and provide selected readings that can be assigned to the students or used as additional background information by the instructor. The guide includes suggested learning exercises and discussion questions for use with students. The exercises and questions are designed to help students deepen their understanding of the issues through role play, observation, and discussion. Each exercise indicates the amount of time it is expected to take. A glossary of selected terms appears at the end of the guide, along with a bibliography.

Acknowledgments

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All errors and omissions are the sole responsibility of the authors.

2. Background: History and Description of Mankòtè Mangrove

Teaching point:	The Mankòtè case embodies nearly twenty years of experience in applying participatory and collaborative methodologies to a multi-use approach to resource management that has proven to be compatible with meeting human needs and maintaining ecological services.
Key concepts	<ul style="list-style-type: none">• ecosystem• open access regime• sustainable development• equity
Suggested reading:	<p>Geoghegan, T. and A.H. Smith. 1998. Conservation and sustainable livelihoods: Collaborative management of the Mankòtè mangrove, St. Lucia. Community Participation in Forest Management Series, Caribbean Natural Resources Institute. 16 pp.</p> <p>Renard, Y. 1994. Community participation in St. Lucia. Community and the Environment: Lessons from the Caribbean. Panos Institute and Caribbean Natural Resources Institute. No2.12 pp.</p> <p>Smith, A.H. and F. Berkes. 1992. Community-based use of mangrove resources in St. Lucia. International Journal of Environmental Studies. 43(2/3):123-130.</p> <p>Walters, B.B. and M. Burt. 1991. Integrated management of common property fuelwood resources from natural and plantation forests in St. Lucia. Paper presented at the IDRC Workshop on Common Property Resources, Winnipeg, Canada, September 1991. CANARI Communication no. 35.21 pp.</p>

Introduction

To the casual observer, St. Lucia's Mankòtè mangrove is a healthy basin mangrove that supports a range of plant and animal life and provides ecological services. From an attractive wooden viewing tower in the swamp, visitors to the area can see and hear several species of migratory and local birds, like the common gallinule (*Gallinula chloropus*) and the little blue heron (*Egretta caerulea*). A short walk into the mangrove stand on one of the paths leading from the main road could reveal a smoldering mound, evidence that the area is being used for charcoal production. A stroll along the shoreline at dawn might reveal a fisher from a nearby village casting his seine net for tarpon (*Megalops atlanticus*). A stroll in the same place at dusk might reveal a young child hunting for crabs. Habitat, nursery, fishing and hunting ground, source of livelihoods and recreation site, Mankòtè is all these. But there is more to this wetland.

Within St. Lucia and the Caribbean, Mankòtè embodies a unique eighteen-year experience in participatory integrated conservation and rural development that offers a series of lessons about the conditions, skills and tools that enable a participatory management arrangement that meets both socio-economic and conservation objectives.

The Mankòtè mangrove is located in the Vieux Fort region of southeastern St. Lucia. It is St. Lucia's largest remaining mangrove forest. It covers a mere 63 hectares or approximately 150 acres along the island's southeast coast. Locally and nationally it is significant because of its ecological importance and economic uses. Despite its small size, it is significant internationally because it is one of the few examples of seemingly sustainable mangrove harvesting in this hemisphere. Mankòtè is the single largest source of charcoal in the southeast coast/Vieux Fort area, supplying between 20 - 30 percent of the charcoal used there (Hudson 1997).

In 1981, Vieux Fort and its environs were targeted by the St. Lucia National Trust for a comprehensive programme of conservation and development. This came in response to growing concern about the degradation of highly productive ecosystems, the depletion and destruction of important natural and cultural resources and the pollution and contamination of certain coastal and marine ecosystems. The Caribbean Natural Resources Institute, CANARI (then the Eastern Caribbean Natural Area Management Program, ECNAMP) worked with the Trust to conduct a study of the southeast coast and develop a series of management plans based on conservation and development requirements for the area.

The project

The Mankòtè mangrove was identified as a priority area for intervention because of the pace of the degradation that was occurring there: the area had become a popular site for solid waste disposal and the target of mosquito eradication schemes which had a deleterious effect on the mangrove **ecosystems**. Additionally, the area, which until then had been managed under an **open-access regime**, was declared a marine reserve by the Department of Fisheries and was to be closed to all extractive uses, including charcoal production, which had been traditionally practised there. Based on the findings of the southeast coast study, CANARI set about developing a project that would meet the needs of the charcoal producers, restore the health of the mangrove, and increase its productivity, not just for charcoal production but for its other biological functions as well. The needs identified during the consultation were divided into two main categories: ecological (new and improved harvesting techniques, building on traditional knowledge and practice, removal of waste, drainage) and socio-economic (security of tenure, and additional income generating activities).

The project plan had two main components: first, the improvement of existing uses and management of the mangrove by the charcoal producers; and second, reduction of the pressure on the mangrove through the establishment of a fuelwood plantation and the diversification of economic activities. Through ongoing dialogue between project personnel and the charcoal producers, harvesting methods based on traditional practice and new techniques were developed. These impact mitigating methods continue to be used more than eighteen years later with a number of refinements and modifications based on experience and research.

Resource users as resource managers

Today, the charcoal producers, organised as the Aupicon Charcoal and Agricultural Producers Group (ACAPG), play an active role in managing the mangrove through a communal management system in which access for charcoal production is limited and harvesting controlled. The group currently comprises fifteen members, not all of whom are active, however. The ACAPG plays a key role in collecting data for monitoring levels of charcoal production and trends in the volume of wood in the mangrove. The data are analysed by CANARI and information is shared with the charcoal producers.

The charcoal producers have begun to diversify their income generating activities inside and outside the mangrove. Through the project a woodlot and agricultural plot were established on a 25-acre site at Aupicon close to the mangrove. The objective of the woodlot is to ease pressure on the mangrove, and provide the charcoal producers with a year-round supply of wood for charcoal. Through the agricultural project, the producers, many of whom are landless, have access to land which some of them farm both communally and individually. Eco-tourism is another spin-off activity of the project, and some of the charcoal producers have begun to devote their time and effort to tour guiding and maintaining a viewing tower and visitors' area in the mangrove.

Context for management

The management arrangement for the Mankòtè mangrove has been developed within a **sustainable development** framework. The intervention sought to protect the resource and maintain productivity while ensuring not only that the main group of users could continue to reap socio-economic benefits from the area, but also that these benefits could be increased over time. These mutually-reinforcing objectives formed the basis of the management plan that was developed for Mankòtè. The approach to management that was used was informed by underlying principles of sustainability, **equity** and justice. The experience illustrates that conservation and economic use of natural resources are not necessarily incompatible and demonstrates how a group of resource users can be integrated into management. The case of Mankòtè cannot be presented as a paradigm; it is specific to the particular circumstances and conditions that present themselves in this instance. However, it offers important lessons about the requirements and conditions for participatory resource management processes.

Suggested Learning Exercises

1. Background and Rationale

Objective: The student will be able to indicate at least one reason for implementing a management strategy in the Mankòtè area.

Proposed duration of exercise: 20-30 minutes

Exercise:

- Participants read the Mankòtè case study before the session.
- Each person writes 3 reasons for the intervention that occurred at Mankòtè in response to the question "Why was the site in need of management?"
- The instructor consolidates the reasons and gets consensus on the rationale behind the activities described in the case study.
- Participants should define reasons for management in another mangrove area of their choice and compare with Mankòtè.

2. Indicators of Success

Objective: The student will be able to identify some of the types of activities and interventions associated with a successful collaborative management strategy.

Proposed duration of exercise: 45 minutes to 1 hour

Exercise:

- Each student writes what he or she believes would be an indicator of success in the Mankòtè case. *This information is kept private.*
- The class is broken up into groups and each group is asked to formulate a list of indicators of success as seen in the case study.
- The class shares lists in a plenary session. The instructor ensures the class' list of indicators is reasonably accurate.

3. Functions and services of mangrove

Teaching point:	Mangroves are an important element of the coastal ecosystem that perform and provide a range of environmental, social and economic functions and services.
Key concepts	<ul style="list-style-type: none">• conversion• multi-user resource system
Suggested reading:	<p>Bossi, R. and G. Cintrón. 1990. Mangroves of the wider Caribbean. UNEP, Caribbean Conservation Association and the Panos Institute. 30 pp.</p> <p>International Newsletter of Coastal Management. March 1997. Special Mangrove Edition, Special Edition N° 1. Intercoast Network. 42 pp.</p> <p>Kunstadter, P. 1986. Socio-economic and demographic aspects of mangrove settlements. Pages 1 - 10 <i>in</i> Kunstadter, P. <i>et al.</i>, eds. 1986. Man in the mangroves: the socio-economic situation of human settlements in mangrove forests. The United Nations University. 117 pp.</p>
Additional references	<p>FAO. 1994. Mangrove forest management guidelines. FAO Forestry Paper No. 117. Food and Agriculture Organization of the United Nations. Rome. 319 pp.</p> <p>Field, C. D. 1995. Journey amongst mangroves. International Society for Mangrove Ecosystems, Okinawa, Japan. 140 pp.</p> <p>Hamilton, L.S. and S.C. Snedaker, eds. 1984. Handbook for mangrove area management. Environment and Policy Institute East - West Center, IUCN, UNESCO, and UNEP. 123 pp.</p> <p>Robertson, A. I. and D. M. Alonghi, eds. 1992. Tropical mangrove ecosystems. Coastal and Estuarine Studies Series Volume 41. American Geophysical Union. Washington, D.C. 329 pp.</p> <p>Suman, D.O., ed. 1994. El ecosistema de manglar en America Latina y la Cuenca del Caribe: su manejo y conservación. Rosenstiel School of Marine and Atmospheric Science, Universidad de Miami. The Tinker Foundation. New York. 263 pp.</p>

What are mangroves?

There is considerable variation in the appearance of the woody plants that are generically referred to as mangroves. Some species, such as the red (*Rhizophora mangle*) and black mangroves (*Avicennia germinans*) have been known to grow up to 50m in parts of South America, but these same species

and others sometimes reach no more than 3ft at maturity in particularly arid areas. Several species have the prop roots that are generally associated with mangroves, while others have horizontal main roots that grow just below the soil surface and produce perpendicular pneumatophores that protrude from the water. But despite the differences in appearance and physiology, mangroves all share the distinctive trait of being able to grow in and tolerate saline environments---a rarity in the plant world. Seven of the estimated 60 true mangrove species of shrubs and trees found worldwide occur in the Caribbean (Bossi and Cintrón 1990).

Ecological functions

Mangrove forests are highly productive and diverse coastal ecosystems that perform a range of biological, social and ecological functions. Mangroves provide habitats for several species of shore birds and waterfowl, and in some instances for turtles and other reptiles, porpoises and even manatees. Mangroves are important for artisanal and commercial fisheries, serving as breeding grounds for various species of fish and shell-fish. They also play a critical role in shoreline stabilisation and protection, helping to safeguard against wave damage and erosion. Mangroves help to maintain coastal water quality by incorporating or trapping terrestrial run-off that may include inorganic nutrients, heavy metals or pesticides.

Social and economic services

Coastal communities have traditionally incorporated mangroves into their livelihood strategies, using the forests for such activities as subsistence and commercial fishing, and the production of fuelwood, wood, honey and salt. Mangroves also figure largely in recreation in many places the world over and are used for activities such as fishing, hunting, bird watching and bathing.

Threats to Caribbean mangroves

Despite their multiple uses and important ecological functions, mangroves are often undervalued and quickly sacrificed in the name of development and progress. Several of the Caribbean's mangrove forests, for example, have fallen prey to tourism development or urban expansion. Others have been degraded by pollution and unsustainable harvesting for charcoal and fence posts. It should be noted, however, that more damage has been done to mangroves through **conversion** to other uses than through unsustainable exploitation by traditional users (Bossi and Cintrón 1990).

An approach to managing mangroves

Considering the range of services and functions of mangrove forests, the arguments for their protection and proper management are compelling. Whether they are found in Africa, Asia or the Caribbean, mangroves tend to be **multi-user resource systems**, supporting a range of human actors and activities. Caribbean mangroves are often a source of wood for domestic use and fuelwood, and are used for recreational and subsistence fishing and hunting. Consequently, the management of mangrove

forests has to take social and economic issues into account, in addition to ecological functions and should be based on a complete understanding of all these parameters (FAO 1994).

Mangroves in the Caribbean often fall under the jurisdiction of more than one agency: forestry divisions are usually responsible for wood uses and fishery departments and other agencies generally oversee non-wood uses, including fisheries management and coastal protection.

Additionally, legal responsibility for mangrove management is often complex: In the case of St. Lucia, for example, the only way that the Department of Forestry can legally exercise management rights in Mankòtè is to enforce a regulation that requires permits for the transportation of wood. Fisheries departments are generally involved in management only when the mangroves are declared marine reserves. Proper management therefore also requires inter-agency coordination and an integrated approach to management. A multi-use approach to managing mangrove forests is compatible with meeting human needs and maintaining ecological services. But such an approach to management is most effective when it is grounded in a philosophy of participation and collaboration.

Suggested Learning Exercises

1. Functions and Services of Mangroves

Objective: The students will be able to describe the social, economic and ecological goods and services provided by mangroves.

Exercise 1a:

Proposed duration of exercise: 45 minutes

Materials: Reference materials and slides or video on mangroves and their ecological services.

Exercise:

- The class reviews the reference materials and views the audiovisual presentation.
- The class is divided into 3 groups and each is assigned one area: social, ecological or economic.
- Each group is asked to generate a list of services from mangroves that benefit society.
- The class reconvenes and each group reports. During the full group discussion, the instructor guides the class in recognising the connections between the three areas.

Exercise 1b:

Proposed duration of exercise: One -half day field trip and 1 hour class session (This activity is appropriate for in-service groups.)

Materials: Reference materials on mangroves and their ecological services.

Exercise:

- The class reviews the reference materials.
- The class is divided into 3 groups and each is assigned one area: social, ecological or economic.
- The class is guided through a one-half day field trip to a mangrove area.
- Following the field trip, each group will develop a report on the services that mangroves provide in their assigned area.
- During the full group discussion, the instructor guides the class in recognising the connections between the three areas.

4. Issues and Topics

4.1 Participatory and collaborative approaches to natural resource management

Teaching point:	Participatory and collaborative approaches place resource management in a wider sustainable development context so that human development needs and ecological requirements can be met.
Key concepts	<ul style="list-style-type: none">• participation• community-based management• collaborative management (co-management)
Suggested reading:	<p>Bass, S., B. Dalal-Clayton and J. Pretty. 1995. Participation in strategies for sustainable development. International Institute for Environment and Development. London, United Kingdom. 118 pp.</p> <p>Borrini-Feyerabend, G. 1996. Collaborative management of protected areas: tailoring the approach to the context. Issues in Social Policy, IUCN, Gland, Switzerland. Chapters 3 and 4.</p> <p>Brown, N. A. 1995. Popular participation and empowerment in natural resource management. Paper presented at the Second Commonwealth NGO Forum, Wellington, Aotearoa/New Zealand 18 - 23 June 1995. CANARI Communication no. 46. 14 pp.</p> <p>Rodal, A. and N. Mulder. 1992. Partnerships, devolution and power-sharing: issues and implications for management. Optimum, The Journal of Public Sector Management, pp. 27 - 48.</p>
Additional references	IIED and ODA. 1994. Whose Eden? An overview of community approaches to wildlife management. International Institute for Environment and Development, United Kingdom. 124 pp.

Why manage?

Natural resource management is concerned with organising, controlling and regulating the use of a resource, rather than controlling and regulating the resource itself. The range of natural resource management approaches that are characterised by participation and collaboration was developed in response to the limitations of conventional top-down approaches to management. These approaches are undergirded by a philosophy of protection or preservation and are characterised by regimes in which management is the responsibility of central authorities, to the near complete exclusion of community groups, resource users or local authorities (IIED and ODA 1994).

Although top-down approaches can be effective for the conservation of biodiversity and the preservation of natural areas for scientific or recreational use, they often ignore the needs of, and

alienate, local communities and users whose livelihoods depend in part or full on use of the resource. They also fail to capitalise on the knowledge and information that local communities and users might have about the resource.

To be truly effective and sustainable, resource management interventions must consider the interface between conservation requirements and human development concerns. Forging partnerships between resource management agencies and communities or user groups is one way of helping to place natural resource management in its broader social, cultural, economic and political context. Within development and resource management circles, participation is now a generally accepted alternative to the limitations of the top-down approach and is recognised as a key element of development that is environmentally, economically, socially and culturally sustainable.

Community and user-group participation in resource management

Far from being a philosophy espoused by a marginal few, today participation is accepted by many organisations as a guiding principle, even if the policy implications of and practical requirements for the participatory approach are not fully appreciated or accepted.

In the context of natural resource management, **participation** can be defined as the process that 1) facilitates dialogue among all actors, 2) mobilises and validates popular knowledge and skills, 3) supports communities and their institutions to manage and control resource use and 4) seeks to achieve sustainability, economic equity, social justice and maintain cultural integrity (Renard and Valdés Pizzini 1994). Participation is relevant to all aspects of resource management, from data gathering to information processing, to decision making, to resource utilisation and enforcement. The rationale for participation can be found in the following arguments:

- Resource users are an important source of information about the natural systems they depend on directly to earn their livelihoods, and possess knowledge and skills that can contribute to improved management.
- Traditional management systems can be cost effective and provide a good base for modern management arrangements. Many such systems have proven to be sustainable over time, though some are breaking down because of external factors.
- Communities and resource users are more likely to uphold management decisions and regulations when they have a say and a stake in planning, implementation and management.
- In the socio-cultural context of the Caribbean, where segments of the society have been systematically excluded from ownership and control over land and resources, participatory processes in natural resource management can contribute to a social integration agenda.

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- Participatory processes can strengthen collective action and contribute to community empowerment.

The forms of participation in resource management are many and varied, as are the outcomes of participatory processes. At one end of the participation continuum is consultation, where stakeholder opinions inform management decisions, and at the other is devolution, where management responsibility is transferred, or devolved, from the management authority, usually the State, to a local group or agency. This form of management is sometimes referred to as **community-based management**. Within this continuum, there is no preferred or ideal model. The skills and capacities of the management partners, the requirements of the resource, and the conditions under which management occurs all help to determine the level of participation and form of partnership appropriate to the case in question. The challenge of the participatory approach is, to a large extent, to identify the form of participation best suited to a particular circumstance.

Factors such as the type of resource, patterns of use, and management requirements, all help to determine the most appropriate management regime. Participatory planning and participatory management are two very different activities, and the former does not automatically lead to the latter. A participatory planning process can determine that a centralised management regime is most appropriate for the resource in question. What is important is for the process of decision making to be consensual and for the outcome to reflect the views and long-term interests of all actors.

Within the wide range of available options, one possible participatory management arrangement is **collaborative** or **co-management**, where there is formal sharing of management responsibilities between two or more parties, in which roles and responsibilities are clearly articulated and understood and are determined by interest, stake and capacity. (The terms co-management and community-based management are sometimes used interchangeably, but the two concepts are distinct and should not be confused.)

There are undergirding principles that can help ensure that the partnership is equitable and that participation rather than co-option occurs. These include involving stakeholders at all stages of decision-making, from consultation to implementation to management; equity; transparency; mutuality; legitimacy of all partners; and a commitment to learning and evaluation (Krishnarayan 1998).

Participatory management is often considered to be cost effective, because it marshals the voluntary resources of a range of actors and therefore can be less costly to a management agency. While the sum of most management inputs is likely to be similar under either a participatory or a centralized management regime, enforcement inputs tend to be lower under participatory management because users tend to be more compliant.

In practical terms, however, the argument of cost-effectiveness is sometimes difficult to make to developing country governments, whose financial resources are so limited that even the costs of participatory management are prohibitive. The alternative, unfortunately, is often no management at all.

In developing participatory management arrangements and dividing management responsibilities, it is necessary to assign value to the contributions of each of the partners, and to accept the principle that some form of compensation of comparable value must be made. In some cases, there is the possibility of deriving revenue from goods and services related to the management regime such as guided tours. In other cases, non-monetary benefits must be identified and assigned. Without such benefits, the management partners have no obligation to continue their participation over time. Even the participation of government agencies will lag if there are no obvious benefits to the state from the management activities.

Key lessons from Mankòtè

- *Participatory processes can contribute to the long term viability of natural resource management interventions.* The participatory management arrangement in Mankòtè has helped assure the survival of the mangrove for almost twenty years and has reversed the trend of degradation there through the integration of the main resource user group into management and decision making about the resource. The result is a management regime that affords the mangrove greater protection than any government agency or other institution could provide on its own. (Geoghegan and Smith 1998:7)
- *Communities or user groups are more likely to sustain their participation when needs are met by the management intervention.* The success of the approach in Mankòtè has depended on the support and collaboration of the Aupicon Charcoal Producers Group. The ongoing participation of the members of the group is in large part due the tangible, though somewhat limited, social and economic gains of their involvement (Geoghegan and Smith 1998:9,13).
- *Participatory processes are dynamic, and the level and form of participation by all actors can change over time.* In Mankòtè, the level and quality of participation by the main user group has evolved over time reflecting the changing needs and improved understanding of the management requirements by all parties, and the increased capacity of the charcoal producers' group. (See Section 4.7 Organisational Development.) The situation has effectively gone from one of consultation (at the start of the project) to one where the charcoal producers play a role in decision-making about resource use as part of a *de facto* co-management arrangement for

the area. At the same time, the role of CANARI and other external agencies has changed in response to the increased capacity of the charcoal producers.

- *For participatory processes and arrangements to endure, the benefits of participation must be evident to all actors.* While there has not yet been an integrated effort to value the services provided by the management partners, it appears that the partners are generally satisfied that their services are adequately compensated. The form of this compensation varies significantly:
 - for the ACAPG, the benefits include exclusive cutting rights (see appendix 1) in the mangrove, access to land for additional fuelwood production and farming; and training and support to develop other economic endeavours such as tour guiding;
 - CANARI has sought financial support for its work in Mankòtè through donor agencies, and in doing so has been the only partner to specifically cost its contribution;
 - the government agencies have benefited from the reduced need to devote resources to managing the mangrove, as well as from the image enhancement resulting from their support of a successful management regime.

Suggested Learning Exercises

1. Management Strategies

Objective: The student will be able to recognize and describe characteristics of various management strategies.

Proposed Duration of Exercise: Exercise 1a: In-service course--establish groups and provide reading and assignment the day before, 2.5 hours in plenary session.

Undergraduate course--Give materials and set up groups; groups work outside of the classroom; plenary 1-hour session in class.

Exercise 1b: 30-45 minutes.

Exercise 1a:

- Instructor provides reference materials on 3 major management strategies and assigns each group to read about one management strategy. (Suggestion: conventional conservation strategy, collaborative management strategy, community-based management strategy)
- Each group is asked to describe the main elements of a management plan for Mankòtè from the perspective of the strategy assigned to them.

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- The groups report to the class in a plenary session and receive feedback on the strengths and weaknesses of each approach.

Exercise 1b:

- The instructor gives an overview of 3 major management strategies to class.
- Students are asked to participate in a discussion on how alternative management strategies might work for the Mankòtè mangrove ecosystem.

2. Participatory Management

Objectives: The student will be able to identify issues related to participatory management and benefits of the participatory management approach.

Proposed duration of exercise: 1 hour.

Materials needed: Case Study, role play panel.

Exercise 2:

- One student poses as the director of a resource management agency who wishes to develop sustainable management practices for mangrove ecosystems.
- Other students (in pairs or small groups) play the role of the director's advisors, and offer the decision-making panel key information on the following topics:
 1. economic sustainability (definitions, applications and indications of success, and evaluation);
 2. research needs ;
 3. participatory management;
 4. which organisation(s) might serve as facilitators, mediators.
- Groups deliberate for 30 minutes.
- Advisors and the director formulate guidelines based on combined recommendations.

4.2 Sustainable use of resources

Teaching point:	Participatory and collaborative approaches place resource management in a wider sustainable development context so that human development needs and ecological requirements can be met.
Key concepts	<ul style="list-style-type: none">• sustainable use
Suggested reading:	IIED and ODA. 1994. Whose Eden? An overview of community approaches to wildlife management. International Institute for Environment and Development, United Kingdom. 124 pp.

Rationale for sustainable use

The maintenance and enhancement of social, cultural and economic benefits are an essential part of the participatory and collaborative approach to natural resource management. In the definition of "sustainable use," two main principles apply:

- environmental sustainability: the use of the resources must not compromise the ability of the resource to renew itself and to provide goods and services in the future;
- equity: access to the resource and the distribution of benefits from resource use must be equitable; similarly, the costs involved in resource use and management must be equitably distributed.

The maintenance and promotion of sustainable uses are important elements of the approach because:

- it is a central objective of collaborative resource management to sustain livelihoods and to provide benefits to people. Resource use is not an obstacle to conservation and resource management, it is an integral part of the approach;
- improved benefits provide incentives for participation. Stakeholders who generate income, employment or services from a participatory management arrangement are likely to become more committed to its success as a result. Governments, policy makers and opinion-shapers are also likely to give more support to arrangements which provide direct goods and benefits to people.

Sustainable use considerations for participatory processes

In order to promote such uses, resource managers and facilitators of participatory processes must examine a number of questions:

- what are the existing uses at the beginning of the planning exercise or the management intervention? These must be analysed in terms of their social, cultural, economic and

environmental impacts. As a result of this analysis, three basic options are available: 1) maintaining the use, because it impacts only positively on the resource and the users, 2) transforming the use, in order to ensure that all its impacts become positive, or 3) terminating the use, because its negative impacts cannot be alleviated. This analysis must be part of the initial stages of the planning process, and must be participatory;

- when a particular use can be maintained, what are the legal and technical conditions under which it should be maintained? In a sense, this represents a formalisation of the existing patterns of resource utilisation, to ensure that they fit in the new management regime, that they are properly monitored, and that they are not modified in a manner that would introduce new negative impacts;
- if a particular use needs to be transformed, what are the changes in the conditions of resource use which need to be modified? This is an area where participatory research is critically needed, to involve all relevant stakeholders in a process of analysis of the impacts of existing patterns, in the formulation of specific objectives and criteria for assessment and evaluation, and in the identification of new patterns to meet the said objectives;
- if a particular use must be discontinued, what will the impact be on resource users and what are the measures that can be taken to remedy these impacts, and are there alternative uses which can be promoted? This type of analysis requires the involvement of all stakeholders, particularly those resource users who will be directly affected by the termination of the activity;
- independently from current patterns of resource use, are there other activities which can be promoted on a sustainable basis and which can provide benefits to people, particularly those who need these benefits the most, because of their historical reliance on that resource or because of their current economic status? This is another important field of research, where resource managers and facilitators of participatory processes must prospect for new activities that are sustainable, culturally appropriate, socially acceptable, and economically feasible.

Assessing sustainability

To determine whether or not a particular use is sustainable requires information on the level, or rate, of use, and the corresponding trends in the status of the resource. This requires an appropriate monitoring programme. In the case of Mankote the principal extractive use is the production of charcoal and to be sustainable the rate of extraction must not exceed the rate of wood production of the exploited tree

species. The first assessment of sustainability was conducted between 1989 and 1992 (Smith and Berkes 1993) during which time there was an increase in charcoal production, and an increase in the density and basal area of trees. These early results were important as they indicated that the level of charcoal production was sustainable and lent support to the collaborative management initiative that allowed the charcoal producers to harvest resources in a Marine Reserve.

Since then, CANARI has continued to test methods for assessing sustainability, with an increased emphasis on the use of standard forestry procedures and increased participation by the charcoal producers in field work. Charcoal production in 2000 is shown below, and is slightly lower than the average for the past 15 years (WRI 2000). The very low level of production in September was the result of heavy rains that kept much of the mangrove under water, preventing the burning of charcoal pits.

Charcoal production at Mankòtè, January - October 2000.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
bags.mo ⁻¹	86	100	87	73	63	94	102	89	6	68	196	444
kg.mo ⁻¹	1833	2132	1855	1556	1343	2004	2175	1897	128	1450	4181	9470

To estimate trends in the volume of wood in the mangrove, a number of permanent inventory plots have been marked, each 0.04 hectares in area. The diameter of all trees greater than 25mm dbh (diameter at breast height, i.e. 1.3m) is recorded in each plot, and converted to tree volume using a factor derived from earlier sampling of a range of tree sizes. The measurements are repeated each year until the area is ready for harvest. The combined data from all plots will be used to estimate the change in the volume of wood in Mankote over time, and to assess the sustainability of the current level of exploitation.

Key lessons from Mankòtè

There are a number of traditional uses of the area which are culturally significant and have negligible negative impacts on the resource, namely fishing and recreational bathing. So far, the approach has been to allow these activities to continue without specific regulation, but there may now be need for more research to assess the impact of the activities in greater detail and to provide the basis for a formalisation of the conditions under which these activities would be allowed to continue.

- *When properly managed, extractive resource uses can be sustainable.* The most important economic activity in the mangrove, namely charcoal production, is one that was considered

environmentally damaging at the beginning of the process. Over the past fifteen years, work has focussed on the progressive transformation of the conditions and patterns of resource use to make them sustainable. The principal measures employed have been the restriction of access to prevent increases in exploitation and to ensure that harvesting would be limited to the voluntary participants in the collaborative management arrangement and the adoption of slightly modified harvesting techniques to enhance regeneration. This experience has demonstrated that sustainable uses can be developed and maintained, under appropriate conditions;

- *The conditions under which new activities can be incorporated in a communal production system need to be carefully analysed prior to the introduction of these activities.* At the same time, this programme has been concerned with the provision of alternative sources of natural goods, income and employment, within the area under management (with the development of nature tourism activities in the mangrove) and outside of the area (with the establishment of a fuelwood plantation on dry marginal lands and of a cooperative farm on publicly own lands). These efforts have met limited success.

4.3 The participatory planning process

Teaching point:	Participation should be built into project interventions from the outset, beginning with issue identification, project design and planning.
Key concepts	<ul style="list-style-type: none">• planning• stakeholder
Suggested reading:	Bean, W. 1991. Participatory program planning for community-based change initiatives, a brief handbook for field practitioners. Coady International Institute, Antigonish, Nova Scotia, Canada. 26 pp.

Elements of participatory planning

The participatory planning process is, in many respects, very similar to the more conventional approach to **planning**, which typically includes the following elements:

- problem identification and determination of priorities
- definition of goals and objectives
- determination of the approach and assessment of feasibility
- formulation of action plans and management measures
- design of institutional arrangements and implementation of mechanisms
- definition of monitoring and evaluation mechanisms

There are however two critical sets of factors which make the planning process participatory:

- the adequate identification of all **stakeholders**, early in the process
- the full involvement of these stakeholders, at all stages in the process

Step 1

Experience has shown that any stakeholder (government agency, non-governmental organisation, community, researcher, external agency) can take the initiative for a participatory planning exercise. The initiator must have a certain amount of credibility and legitimacy. The initiative can come from the manifestation of a conflict or a crisis resulting from resource utilisation, or from the conscious realisation by the initiator that there are management issues requiring attention in order to improve the conditions of resource use and their impacts on sustainability and equity. It is at this early stage that three important decisions have to be made:

- the initiator must decide that the planning process will be participatory;
- the initiator will make arrangements for the facilitation of the process; and
- the initiator must decide which methods will be used.

Step 2

The next step in a participatory planning process should involve a number of appraisals and assessments, which must be as participatory as conditions permit, and which should involve:

- the identification of the groups, sectors, communities and individuals who have a stake in the resource or issue which is the object of the planning initiative. This activity is generally not participatory, as its purpose is, by definition, to identify those who should participate in the process. Procedures for stakeholder identification are described in section 4.4, Integrating Stakeholders into Management.
- the analysis of the expectations, rights and responsibilities of these various stakeholders (see section 4.4). This step is ideally conducted in a participatory manner, as this becomes an excellent mechanism for conflict management, because it provides a forum for each party to hear and understand the perspectives of others, and to make its own perspectives heard and understood;
- the analysis of needs, issues, causes and options: this is the first main step in a classical planning process. In a participatory process, these analyses follow the identification and analysis of stakeholders, and must therefore involve all these stakeholders. A wide range of tools is available and used to conduct such analyses, including those described in the literature as participatory rural appraisal and rapid rural appraisal techniques, as well as scientific methods such as biological and socio-economic surveys, impact assessment studies and literature reviews; and
- the identification of options: this is a most critical step in a participatory process, as this is where all participants take the results of the various analyses to define priorities and to identify the various options available to them, with an appreciation of the costs and benefits associated with each.

Considerations for management

It is on the basis of these options that management decisions can be formulated. These typically include: conditions of resource utilisation, zoning, specific management programmes (e.g., education, information, business development, research, monitoring, institutional arrangements, financing mechanisms, and legal instruments). The terms of management are normally couched in management agreements (see section 4.6 below).

One of the added benefits of these participatory appraisals and assessments is that they build the confidence and ability of all participants, notably the powerless, to become involved in decision-making

and management. On the basis of results obtained, partners in the planning process must be in the position to define objectives, to formulate action and management plans, to design monitoring and evaluation procedures and to begin implementation.

There is another important characteristic of the participatory planning process. Because its purpose is change (in perceptions, relations, practices and outcomes), it is not a linear process, but one that creates change at every step along the way. Inherent in the concept of participatory planning, therefore, is the idea that change is constant and that action can take place at any stage in the process. Participatory planning processes do not require the completion of a plan to witness changes on the ground. Their purpose is to change conditions, and thus to provoke action. In the participatory approach to planning, implementation does not follow planning. It is a part of the planning process.

Key lessons from Mankòtè

- *An external agency with no direct stake in a resource can initiate a participatory planning process, once this agency is considered credible and legitimate by all stakeholders.* The origin of the Mankòtè planning process in the early 1980s came from the Eastern Caribbean Natural Area Management Programme (ECNAMP), which had been asked by the St. Lucia National Trust to assist with conservation activities in two specific areas on the south east coast of St. Lucia (Savannes Bay and Maria Islands). From its preliminary identification of sites and issues, ECNAMP had concluded that several other resources and sectors, including the Mankòtè mangrove and the charcoal production taking place within it, required planning and management. ECNAMP, and its successor CANARI, have since played the main facilitating role in planning and management activities in the mangrove. This role has been accepted by all parties, and it has been performed effectively;
- *Benefits can be accrued from the participatory approach with respect to the formulation of objectives.* At the origin of this initiative, each one of the main participating groups had its own agenda and its own priorities. Although several of the stakeholders have not been sufficiently involved in the process (see section 3.4) the consultations and negotiations resulted in the definition of a shared agenda of conservation and development, which is far broader than any of the original agendas;
- *A participatory planning process that facilitates the articulation of a wide range of views and needs can lead to a shared understanding of management needs.* The initial stages of the participatory planning process were particularly important, as the facilitators had no preconceived ideas about management issues and possible solutions. The participation of a wide range of actors, including school teachers and students, charcoal producers, local residents and foresters, led to a broad understanding of the management needs and issues in the mangrove.

4.4 Stakeholder identification and analysis

Teaching point:	Identifying and analysing the interests of all groups affected by the management intervention at the start of the project, and as conditions change, can help determine who should participate in management and how, and can help identify and manage actual or potential conflicts.
Key concepts	<ul style="list-style-type: none">• stakeholder• stakeholder identification• stakeholder analysis• empowerment• capacity building
Suggested reading:	<p>Bass, S., B. Dalal-Clayton and J. Pretty. 1995. Participation in strategies for sustainable development. International Institute for Environment and Development. London, United Kingdom. 118 pp.</p> <p>Borrini-Feyerabend, G. 1996. Collaborative management of protected areas: tailoring the approach to the context, Issues in Social Policy, IUCN, Gland, Switzerland. Chapter 2</p> <p>Grimble, R and K. Wellard. 1997. Stakeholder methodologies in natural resource management: a review of principles, contexts, experiences and opportunities. <i>Agricultural Systems</i> 55 (2):173-193.</p> <p>Ramírez, R. 1999. Stakeholder analysis and conflict management. Pages 101 - 126 <i>in</i> D. Buckles, ed. <i>Cultivating peace: conflict and collaboration in natural resource management</i>. International Development Research Centre, Canada and World Bank Institute, Washington, D.C.</p>

Participation and conflict

One of the challenges of participatory processes is that they are "premised on the possibility of consensus between participants about needs and aims" (Mayoux 1995:241). Arriving at this consensus can be difficult because participants often have different and sometimes conflicting interests and objectives. In many respects, participatory processes are processes of negotiation which aim at resolving and managing existing and potential conflicts (between and among resource users, between resource uses, or between resource management objectives and strategies).

Who should participate in management?

The success of any participatory process therefore depends on an adequate identification of all the potential participants in the process. To determine who should participate in management and how, distinctions must be made among the broad collection of individuals, groups and institutions, i.e., **stakeholders**, who interact with the natural resource and who will affect or be affected by the

management intervention. A stakeholder has been defined as “any party with an actual or potential interest in the economic, social or cultural use of the resource” (Krishnarayan 1998). The interests or stakes of the various actors or stakeholders differ because of such things as tenure, ownership, history of use and pattern or type of use.

Effective **stakeholder identification** can help resource managers understand the levels at which people interact with the resource; identify parties that are critical to successful project implementation; and identify current and potential areas of conflict and concern (Krishnarayan 1998). On the other hand, a participatory process that fails to identify and involve some of the stakeholders reduces its chances to succeed, as those who have been excluded could easily be opposed to its outcome, and as it will inevitably suffer from the loss of the ideas, resources and support which these stakeholders would have brought into the process.

In the process of stakeholder identification, a number of important principles must be taken into consideration:

- Differences exist among stakeholder groups. Even when all stakeholders share a common goal, such as the long term sustainability of a natural resource, objectives, needs and priorities may differ. It is essential to identify, with precision, the often competing interests among stakeholders and ascertain who holds these interests.
- Stakeholder groups are not homogenous. Within a single group, sub-groups with varying perspectives and interests may exist. Similarly, the leadership of the group may not adequately represent the interests of all members.
- Stakeholders are not necessarily organised in formal groups. They could, for example, include disparate individuals or households who use the resource for a similar recreational purpose or income generating activity.
- Even when stakeholders are organised in a group, they may not have the capacity to effectively articulate and represent their interests.

The process of determining who should participate in management and how, would however be incomplete if it was limited to the mere identification of the interested parties. This process also requires an **analysis** of the stakes they hold, defined as the sum of the interests, rights and responsibilities which can be attributed to each, in order to determine the most desirable form and extent of their participation in the management process.

Professional resource managers and facilitators of participatory processes must therefore consider the form that the identification and analysis of stakeholders should take, and the methods that can be used. In practice, it is difficult to ensure that all stakeholders are properly identified, because some individuals and groups may not be obvious. Indeed, one of the frequent limitations of participatory processes is that they involve the stakeholders who are geographically close to the resource or the issue, but fail to involve those who are less visible. The most effective way to avoid this problem is to begin the identification exercise with a list of all the current and potential functions of the resources and the sectors which are the object of management, and then to identify, for each of these, the individuals, groups and organisations who are now involved in, or that may be affected by a change in the regime governing the use of the resource or the management of the sector. This exercise can be conducted by a facilitator or a single resource management agency; in practice, it is impossible for the exercise of stakeholder identification to be fully participatory, because its purpose is precisely to identify all potential participants.

For the process of stakeholder analysis, a range of criteria should be used. These include the following:

- degree of effort and interest of the participants;
- degree of social and economic reliance on the resource;
- historical and cultural relation with the resource;
- present or potential impact on the resource base;
- equity in access to and distribution of benefits;
- compatibility with national conservation and development policies;
- current and potential capacity for collaborative management.

It is at this analysis stage that the participation of all stakeholders is highly desirable. In practice, effective participatory planning processes depend, to a large extent, on the ability of all partners to appreciate and understand the various stakes involved. Such processes should therefore aim at creating the conditions for the various participants to express their interests, needs and aspirations, and to confront them with those of others. It is in this sense that a participatory planning process is largely a conflict resolution and management process, when it allows the various parties to define a collective understanding and evaluation of the stakes of all parties.

Depending on the issues identified and on the methods used for the process of stakeholder analysis, specific information will be needed and research activities will therefore be required. Areas to be covered include an assessment of the economic, social and environmental impacts of various activities and options, as well as an analysis of the current and potential conflicts among users and uses.

Process facilitation

In any given situation, not all relevant actors will have the same opportunity and ability to participate. Social factors such as class, language, gender, race, and education can influence the level and quality of participation. **Empowerment** is both an objective of participation and the means by which participatory resource management can be effective and sustainable. Empowerment can be defined as the process by which people, particularly the poor and the disadvantaged, gain and retain control over their lives and destinies through information, skills, resources, authority, cooperation and self-esteem. For participation to lead to empowerment, the process has to be one that not only brings affected groups to the table, but also has mechanisms in place which will allow all stakeholders to be equal in the process. Creating the conditions for participation may require such things as:

- ensuring that meetings are held at times convenient for all major stakeholders;
- convening meetings in settings where none of the actors feel intimidated;
- conducting meetings in a style and idiom that are inclusive, rather than exclusive; and
- strengthening and building the capacity of some stakeholder groups.

Capacity-building is an essential component of the process of strengthening participatory and collaborative natural resource management, and it involves:

- changes in the structures and cultures of participating organisations to facilitate collaboration, power-sharing and devolution of authority;
- procurement of skills needed to perform the functions assigned in the management agreements (including monitoring, sustainable use, communication, enforcement);
- procurement of capital needed to perform the functions assigned; and
- strengthening of organisations, particularly at the community level.

Key lessons from Mankòtè

- The more rigorous the stakeholder identification and analysis, the more likely that all relevant actors will be identified and integrated into management as appropriate. The stakeholders in Mankòtè are very diverse. They include direct users (e.g., charcoal producers), indirect users (e.g., bathers on neighbouring beaches) and non-users (e.g., the owner). The stakeholder identification process used, however, did not reveal all the relevant actors, and the analysis concentrated on the main group of commercial users, the charcoal producers. One consequence of this was the inability to assess the full economic and social importance of the mangrove to a all user groups.

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- *Failure to integrate all stakeholders can ultimately weaken the management arrangement.* Although the stakeholder identification in Mankòtè revealed that there were several stakeholder groups at the community level, only the direct commercial users, the charcoal producers, have been integrated into management, and other groups, such as fishers, crab hunters, recreational users and the wider community have been excluded. Under current conditions, the situation is acceptable, as most of these uses, with the possible exception of crab hunting, appear to be sustainable (Hudson 1997). Were economic conditions in the Vieux Fort area to deteriorate, however, the result could be increased pressure on the mangrove from not just the members of the ACAPG, but from other resource users who have not been involved in the management arrangement in any capacity, and who may not see themselves as having an interest in the long-term protection of the mangrove.

Additionally, the statutory organisation, the National Development Corporation, which is the current owner of the lands, and thus a major stakeholder, has not been sufficiently involved. This is partly responsible for the weakness of the management agreement, which has not been formalised, and the continued vulnerability of the area to economic development schemes.

- *The rights of stakeholders are not always legal rights and may be derived from patterns of use.* The charcoal producers were identified as major stakeholders at the start of the project even though they had no legal rights to the resource being exploited. Today, such rights are widely recognised, " . . . but in 1981, the idea of inviting the participation of persons who were essentially squatters on government land was rather unconventional." (Geoghegan and Smith 1998:4).
- *Integrating stakeholders into management can be empowering, thus, participation can be an end in itself as well as means to improved resource management.* The active role played by the charcoal producers in early research and planning helped build a sense of community among the harvesters and lay the foundation for the formation of the ACAPG. Group members feel that because of their work in the mangrove they have been afforded certain social development opportunities.
- *The interests of all the stakeholders are different, even though there may be agreement on the overarching goal of management.* The charcoal producers have a primary interest in meeting their economic needs and ensuring they can continue to do so over the long term. The interests of the Departments of Fisheries and Forestry are more strongly related to maintaining the health and important ecological functions of the mangrove. In addition to a social justice agenda, CANARI has a strong interest in learning from this experience in Mankòtè and advocating similar approaches across the region.

Suggested Learning Exercises

1. Stakeholder Identification

Objective: The student will be able to articulate the importance of identifying stakeholders as part of effective management approaches for natural resources.

Proposed duration of exercise: For in-service course, one-half day; for an undergraduate senior level course, 2 one-hour meetings and an outside assignment to complete the fourth activity of the exercise below.

Exercise:

- The instructor leads a brief, general discussion on stakeholders and the reason why they need to be identified.
- The class develops a list of the general rights and responsibilities of stakeholders through a discussion.
- The class is divided into 3 groups representing services received from mangroves in social, economic, and ecological areas.
- Each group develops a list of stakeholders associated with their specific service area and ranks each stakeholder against the list of rights and responsibilities using a scale from 0-5 (0 represents no impact or concern and 5 represents the most impact or concern).
- Each group reports to the entire class when it is reconvened and their list is amended based on the class discussion.
- The 3 lists are combined and the class determines which stakeholders appear to have the most at stake with respect to the proposed management of the area. (Note to the instructor: The ranking is based on the number of mangrove service areas a stakeholder impacts or is impacted by, and their score reflects rights and responsibilities.)

2. User Conflicts

Objective: The student will be able to recognize and understand linkages between multiple-use of areas and resources and the conflicts that may arise as a result of this condition.

Proposed duration of exercise: For in-service course, 3 hours; for undergraduate senior level class, 2 one-hour sessions and an outside assignment for activity four of the exercise below.

Exercise:

- The instructor gives a brief introduction on multiple-use and multiple-interests situations within the context of resource management and resource use.
- Members of class are assigned to one of each of the top stakeholder groups identified for the Mankòtè area.
- Each stakeholder group meets to identify and list their interests, uses, needs and things in common with respect to the Mankòtè area. (These items should be written down by each member of the group for use in the next part of the exercise.)
- The instructor establishes heterogeneous groups of stakeholders that are asked to identify any potential or actual conflicts that would occur among the stakeholders of the mangrove. (A recorder for the group should be assigned.)
- The class reconvenes and the groups share their lists of potential and actual conflicts in plenary.

(Note to the instructor: Mankòtè is an example of multiple-use not necessarily leading to, or producing user conflicts. Also, include the community at large as a stakeholder if they were identified as a high-ranking stakeholder.)

4.5 Information and communication for management

Teaching points	<ul style="list-style-type: none">• The transfer and sharing of knowledge and information between and among management partners and stakeholders is an important element of participatory processes. Each party brings a different knowledge base (scientific, popular/traditional) to the intervention and each requires specific information to effectively fulfill its role.• Information and communication are essential for building support for participatory processes.
Key concepts	<ul style="list-style-type: none">• information• research• monitoring• communication• knowledge• advocacy
Suggested reading:	<p>Borrini-Feyerabend, G., ed. 1997. Beyond fences: seeking social sustainability in conservation. IUCN, Gland, Switzerland. Vol 2. pp. 111 - 114.</p> <p>IIED and ODA. 1994. Whose Eden? an overview of community approaches to wildlife management. International Institute for Environment and Development, United Kingdom. 124 pp.</p> <p>Ruddle, K. 1988. A framework for research on traditional knowledge and management of coastal systems, with particular reference to coral reef fisheries. <i>Galaxea</i> 7:179-184.</p>

Information

The production, management and use of information are important components of participatory and collaborative management arrangements. Nine key principles apply:

- all management decisions must be made on the basis of accurate, relevant and up-to-date information. Research and monitoring programmes are therefore needed to ensure the success of participatory management regimes;
- for the management of any system, information is needed on the natural and social components of that system, their relationships and the external factors that affect it;
- research and monitoring involve different types of activities, for different purposes. **Research** activities can be of many different kinds, and aim at improving the knowledge and understanding of organisms, resources and processes. **Monitoring** activities have the more specific objectives of

observing and quantifying change over time. Appropriate methods and tools are needed to achieve these objectives;

- popular knowledge can be an important source of information, and it must be studied and documented, for the benefit of both monitoring and research;
- scientific knowledge is also needed, and it must be generated through appropriate research programmes and methods;
- managers must recognize that popular knowledge and scientific knowledge are two different knowledge systems, which are both significant, even if the data they generate are different. But popular knowledge cannot be imported and used in a science-based management system without validation and interpretation;
- the skills and resources of the primary stakeholders should be used, as much as possible, in the conduct of research and monitoring programmes, in order to encourage their participation in management, to increase the effectiveness of research and monitoring activities, and to provide economic benefits to the local community;
- research results must be systematically redistributed to all participants in the planning and management process. This often requires that data be interpreted and presented in different forms suited to specific groups and circumstances. This redistribution allows all partners to participate more fully in the formulation and implementation of management decisions;
- research and monitoring results must be used in the formulation of management decisions. This implies that channels of communication are put in place in order to ensure that these results do reach decision-making bodies and are made available to them in a timely and appropriate fashion.

Communication and advocacy

Communication is the sending and receiving of information or messages between individuals or groups. Within the context of participatory approaches to resource management, effective communication can:

- encourage participation, by demonstrating the value of playing a part in the planning and management process, and illustrating the benefits that can be gained. This is particularly critical because the Caribbean does not have strong traditions of participation, and because communities are often pessimistic, if not cynical, about the outcomes of consultative and participatory processes, especially those initiated by government agencies. Communication thus contributes to effective mobilisation.

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- provide a mechanism for the articulation of concerns held by various stakeholders. This allows stakeholders to express concerns about various issues affecting them, and which they consider important. It also enhances the process of empowerment by building on information available within the community. The articulation of concerns can also highlight gaps in existing knowledge and consequently point to information requirements.
 - help integrate communities into management by presenting and gathering information relating to the effective and sustainable use of the natural resource and specific techniques that can be employed in natural resource management, and by channelling existing local and traditional knowledge into management.
 - play a critical role in identifying issues that need to be addressed and ensuring that management decisions respond to changing needs and contexts, as well as offer approaches to problem solving and conflict management.
 - establish credibility and build widespread support for specific initiatives by providing a base of information that increases local understanding among general populations, not just among principal stakeholder groups.
 - help to create and enhance links between and among stakeholder groups, thereby enhancing cohesion and understanding.
 - focus attention on a participatory process, and thus create a greater demand for its outcome.
 - make data and information accessible in an equitable manner.

Communication should occur at various levels, and should use a variety of media appropriate to the various audiences.

The term '**advocacy**' is used to describe a series of activities built around a theme or set of themes with the aim of effecting a specific change in action or policy. Advocacy is most effective when directed at specific audiences and built around clear, consistent messages. Advocacy is one of the ways that stakeholders can influence decision-making and public opinion, and rally support.

Advocacy processes can:

- contribute to community development and empowerment. They can help build local capacity to articulate concerns and needs, assist in processes of group formation and community organisation, and build confidence at the local level;

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- create more favourable policy environments and conditions for management;
 - build support from other social actors and help broaden concerns and develop an understanding of issues and stakes;
 - broaden the impact of local management initiatives;
 - help popularise scientific and technical issues; and
 - be a useful tool in preparing stakeholders for participatory processes.

Even when advocacy efforts do not succeed in bringing about the desired policy or behavioural change, the process itself may contribute to the strengthening of civil society, by building NGO and community capacity and raising the level of public awareness and debate. Similarly, benefits can be derived from forging and strengthening networks and alliances.

Advocacy can take different forms, from lobbying and direct action to awareness building to training and education. There is a range of advocacy tools that can be used. These include: meetings, workshops, rallies, case studies and other publications, popular theatre, and the mass communication media. For advocacy to be effective both the message and the messenger must have credibility.

Key lessons from Mankòtè

- *Popular knowledge is an important source of information for planning and management.* In Mankòtè, popular knowledge has been used extensively, notably in the initial stages of the planning process when local charcoal harvesters were the only source of information on the history of the area, the impacts of past and current practices on the resource base, the patterns of drainage in the mangrove and several other aspects;
- *Monitoring programmes that involve resource users can contribute to the information base that is necessary for management.* They also set the stage for the implementation of management strategies by involving the actors in making management decisions and collecting the data on which these decisions are based (Smith and Renard 1994). The charcoal producers in Mankòtè have been involved in collecting harvesting data as part of a monitoring programme in the area since 1986. The information it has generated has been used in the formulation of management decisions. Organisations involved in the conduct of monitoring programmes have made the effort to distribute the results of research to all relevant stakeholders, including the local resources users.

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- *Effective communication between all management partners is essential for the success of the strategy.* Periodic meetings between CANARI and members of the ACAPG have helped foster a sense of ownership among the charcoal producers. During these meetings, monitoring information is shared, and concerns about the state of the resource are raised.
 - *Effective advocacy occurs at various levels and involves a range of actors.* Since 1981, there has been a continuing advocacy effort by a number of institutions in support of participatory management of the mangrove. Vocal national supporters of the mangrove and the management regime there have helped prevent the destruction of the mangrove for commercial development and protect the harvesting rights and management role of the ACAPG (Geoghegan and Smith 1998:7). This group of supporters includes the Department of Fisheries, Department of Forest and Lands, and the St. Lucia National Trust.

The Mankòtè advocacy effort has had a number of shortcomings. Lack of communication from the Mankòtè partners to the political directorate has resulted in threats to the mangrove from politically-endorsed economic development schemes.

- *Resource users can be very credible and motivated advocates.* As the main identifiable user group, the charcoal producers are also important advocates for the mangrove. The very existence of the charcoal producers makes them a constituency that would have to be dealt with in any initiative to alter or destroy Mankòtè. Individually and as members of the ACAPG, the charcoal producers perceive themselves as defenders of the mangrove.

Learning Exercise

Research, information and training

Objective: The student will be able to indicate how research, information, training and monitoring support participatory natural resource management strategies.

Proposed duration of exercise: Outside class assignment and 60 to 90-minute class session.

Exercise:

- The instructor has each student make a list of the examples of research, training, information and monitoring from the case study as an outside assignment.
- The full class will discuss the examples brought by individuals as a class list is compiled and monitored by the instructor for omissions or misunderstandings.

4.6 Institutional arrangements

Teaching point:	Participatory planning processes always result in a transformation of institutional arrangements in order to improve the quality, effectiveness and equity of management.
Key concepts	<ul style="list-style-type: none">• institutional arrangements• property rights• management regime• collaborative management
Suggested reading:	<p>Bass, S., P. Balogun, J. Mayers, O. Dubois, E. Morrison and B. Howard. 1998. Institutional change in public sector forestry: a review of the issues. IIED Forestry and Land Use Series No. 12. 54 pp.</p> <p>Gibbs, C. J. N., and D. W. Bromley. 1989. Institutional arrangements for management of rural resources: common property resources. Pages 22 - 32 <i>in</i> Berkes, F. (ed.) Common property resources: ecology and community based sustainable development.</p> <p>Mehta, L., M. Leach, P. Newell, I. Scoones, K. Sivaramakrishnan and S. Way. 1999. Exploring understandings of institutions and uncertainty: new directions in natural resource management. IDS Discussion Paper 372. 48 pp.</p> <p>Pomeroy, R.S. 1993. A research framework for coastal fisheries co-management institutions. <i>Naga</i> 16(1):14-16.</p> <p>Renard, Y. 1991. Institutional challenges for community-based management in the Caribbean. <i>Nature and Resources</i> 27(4):49.</p>
Additional references	The Commonwealth Foundation. 1996. NGO/Government relations: transitions to new governance. Report on the Commonwealth Regional Workshop for the Caribbean and Canada, Port of Spain, Trinidad and Tobago 15-19 July 1996. 79 pp.

Rights and responsibilities of management

In the context of natural resource management, an **institutional arrangement** can best be defined as the manner in which **rights** and responsibilities over the use and management of the resource are distributed, regulated and applied. These rights and responsibilities are many, but they can be grouped according to the following broad categories: the right to sell the resource (conventional ownership right);

- the right to use the resource and consume or sell the products derived from that use;

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- the right and responsibility to exclude other users;
 - the right and responsibility to define and modify the conditions under which use can take place.

These rights and responsibilities can be placed under four possible **management regimes**:

1. private: one or several of the rights and responsibilities described above are held by a private individual or company;
2. communal: they are held by a group of individuals;
3. state: they are held by a state agency or by the government on behalf of the public; and
4. the rights and responsibilities are not assigned.

It is commonly assumed that the various rights and responsibilities are normally all held by the same entity, and that the most common situations are those where the same management regime applies to all types of rights. The reality is however far more complex, with most situations reflecting a combination of rights among various parties. For example, even in the case of private "property", the state retains several rights and responsibilities, through its policies and programmes. Similarly, it is not rare to find public "properties" where use rights are traditionally held by private individuals or communities.

The goal of participatory natural resource management is to establish institutional arrangements where rights are distributed in the most effective and equitable manner. **Collaborative management**, or co-management, refers to those arrangements where the distribution of rights and responsibilities is significant and formal. Typically, collaborative management arrangements are based on an agreement between two or more partners.

Collaborative management agreements should specify the following:

- Intent/purpose/objective
- Legal basis
- Institutional arrangements
- Procedures for:
 accounting

conflict management
regulations (the what and how)
public consultation; (who should be consulted and how)
monitoring/evaluation/review
duration
endorsements by Ministers of Government;
assets
zoning

The success of collaborative management arrangements depends, to a large extent, on four factors:

1. the quality of the process that has led to the design and establishment of the arrangement;
2. the clarity and specificity of the terms of the management agreement;
3. the effective monitoring and control of implementation and effectiveness of management; and
4. the capacity (human skills, organisational, and financial) of participating individuals, groups and organisations to perform their roles effectively.

Key lessons from Mankòtè

- *Institutional arrangements can shift over time as management strategies and objectives change.* The modern history of the area provides an illustration of a number of management regimes, from the time when most of the rights were in private hands to the situation which existed ten years ago with public sector ownership and a number of other rights actually held communally.
- *Management partners are often required to adapt institutionally in order to fulfil their roles and responsibilities.* In the current arrangement in Mankòtè, roles and responsibilities are distributed among a wide range of actors, and organisations have effected changes in their approach and activities in order to meet the requirements of the collaborative arrangement. There is a collaborative management agreement (see appendix 2) which stipulates the rights and responsibilities of the various partners.

Suggested Learning Exercises

Objective: The student will be introduced to the types of institutional arrangements and legal frameworks often associated with management of natural resources.

Proposed duration of exercise: Exercise a - 1-hour. Exercise b - After groups have been assigned, group-work is completed outside of class; 2-hour plenary session in class.

Exercise 1a:

- Instructor produces an organogram depicting management partners for the Mankòtè area with input from the class.
- Instructor leads a discussion with the class addressing issues of management. For example:
 - Identification of the source of authority for the management duties associated with each management partner.
 - Identification of the roles played by each of the management partners in the management of Mankòtè.
 - Identification of factors that appear to impact the management arrangements described in the case study.

(Note to the Instructor: *De facto* arrangements should not be excluded from the discussion.)

Exercise 1b:

Material needed: Copies of management agreement developed for ACAPG.

- Instructor divides class into groups that represent each of the management partners of the Mankòtè area.
- The groups are asked to review the management agreement and determine if they would propose no changes, modifications, improvements or deletions. All proposals must be justified, made from the perspective of the specific management partner, and address the goal of continued sustainable use of the mangrove.
- The groups report back on their proposals during a plenary session in class.

4.7 Organisational Development

Teaching point:	Partners in a participatory management arrangement must often acquire new skills in order to play their role effectively.
Key concepts :	<ul style="list-style-type: none">• power• capacity building
Suggested reading:	<p>Krishnarayan, V., T. Geoghegan and Y. Renard. Participatory natural resource management: guidelines for assessing the capacity of organisations. CANARI Guidelines Series 3. (In press.)</p> <p>Renard, Y. 1991. Institutional challenges for community-based management in the Caribbean. <i>Nature and Resources</i> 27(4):4-9.</p> <p>Uphoff, N. 1986. Local institutional development: an analytical sourcebook with cases. Kumarian Press, Connecticut, USA. 421 pp.</p>

Because participatory approaches to natural resource management are so different from conventional approaches, management partners are often required to acquire new skills and attitudes in order to effectively carry out their roles and functions.

- The balance of **power** in participatory arrangements differs fundamentally from top-down regimes. In participatory regimes, management authorities are required to relinquish some authority and communities and resource users are required to take on responsibility. Vesting authority in resource user or community groups, however, can change power dynamics at the local level.
- Within a participatory management arrangement, government agencies are required to become facilitators as well as implementors and providers. As such, the role of these agencies is centred more on creating the conditions for other stakeholders to manage than on day to day management of the use of the resource. The shift from manager to partner in management can be difficult. The very centralised and bureaucratic structures of these agencies is often antithetical to participatory methodologies. At the same time, technocrats accustomed to centralised top-down forms of management many feel threatened by partnerships with groups outside of government.
- Resource management agencies and community organisations are not necessarily oriented towards participatory methodologies, and like their counterparts in government, may need to acquire skills that allow them to function as effective management partners. Participatory arrangements should therefore make provisions for strengthening all management partners to allow them to realise their potential as planners and decision-makers.

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- At the community level, organisational development and **capacity building** are sometimes required to go beyond improving technical skills and abilities for management, to include building community confidence to be a part of management and decision-making. This is especially true for poorly organised groups and under represented sectors. In the political and cultural context of the Caribbean, poor, rural populations are often alienated and excluded from power and decision-making structures. Consequently, this group sees little role for itself as an actor or partner in management.
 - Resource users are not always organised in groups; in some instances, groups may need to be formed so that the resource users can effectively represent their common interests.

Key lessons from Mankòtè

- *Organisational development should be functional and not done for its own sake.* The ability of the ACAPG to participate in overall planning and policy implementation is limited, and the group is institutionally weak, lacking in cohesion and management skills. The experience in Mankòtè has shown, however, that even weak organisations can be effective partners under the right circumstances. Within the group there is a strong sense of community and purpose that stem from a stake in the resource, and the benefits derived from it. These have contributed to the longevity of the group and the management regime in Mankòtè (Geoghegan and Smith 1998:9).
- *The type of institutional development support given to local groups can change over time.* While the ACAPG is still largely dependent on CANARI, the support it now receives differs from at the start of the project. CANARI originally functioned as the convener of the ACAPG, calling meetings, making arrangements for the purchase and transportation of supplies, taking the lead in communication with Government and other agencies. Today, the group carries out these functions, and leadership has emerged from within. CANARI has been able to work directly with specific individuals to hone their leadership abilities. After seventeen years of continuous interaction with CANARI, the charcoal producers are now at a point where they can create opportunities for themselves and make decisions about use of the resource, based on monitoring data they help collect.
- *Linkages with other institutions can contribute to the organisational development process.* Members of the ACAPG have been exposed to the operations of other rural farming and forestry cooperatives in St. Lucia. They have also had the opportunity to participate in meetings and workshops about community forestry, where they were required to present their work plans and achievements to other groups. These types of interaction have boosted the group's confidence and allowed members to see the work they have been doing in Mankòtè in a broader context.

Suggested Learning Exercises

1. Community characterisation, organisation and group development

Objective: The student will be able to define community and explain how community organisation and development can impact the success of resource management.

Proposed duration of exercise: 90 minutes.

Exercise:

- The instructor leads a class discussion on the definition of community. (Note to Instructor: Important to highlight potential differences within groups and differences between communities based on common geographic location and communities linked through the use of a resource.)
- Instructor facilitates discussion on the factors involved in group development in the Mankòtè case study. Possible points to stimulate the discussion:
 - description of the development path taken by the Aupicon Group;
 - the necessity for all groups to become formalized and legitimate in order to be functional

2. Skills Required for Participatory Natural Resource Management

Objective: The student will be able to describe a minimum of three skills that are important to implementing a participatory natural resource management strategy.

Proposed duration of exercise: 45-60 minutes

Exercise:

- The instructor asks each student to make a list of five skills that appear to be necessary for the implementation of a participatory natural resource management strategy, and to justify each skill proposed through examples in the case study.
- The instructor assists the class to develop a group list based on the best-justified skills.

5. Glossary

Advocacy: A series of activities built around a theme or set of themes with the aim of effecting a specific change in action or policy. Advocacy activities range from direct lobbying of policy makers to training to information dissemination.

Capacity building: The process of improving the abilities of organisations to fulfill their mandates and prepare for new ways of working.

Collaborative management/Co-management: The formalised sharing of management responsibility between two or more partners. At least one of the partners is the local community or a user group.

Communication: The sending and receiving of information or messages between individuals or groups.

Community: A group of people who share similar goals, values, geographic space and/or experiences. The concept of community can be spatial, social and cultural, or economic.

Community-based management: The transfer of some management responsibilities from a central authority (usually the State) to the community, or in certain cases, the strengthening and formalisation of traditional community responsibility.

Conversion: The removal of vegetation and alteration of an area for other uses.

Information: Knowledge or data.

Ecosystem: A biological community of interacting organisms and their physical environment.

Empowerment: The process by which people, particularly the poor and the disadvantaged, gain and retain control over their lives and destinies through information, skills, resources, authority, cooperation and self-esteem.

Equity: "Fairness; system of justice supplementing or prevailing over common and statute law"¹.

Institutional arrangements: The manner in which rights and responsibilities over the use and management of a resource are distributed, regulated and applied.

Management regime: A system under which natural resources are regulated and controlled. There are four main categories of management regimes:

- private: one or several rights and responsibilities are held by a private individual or company;

¹The Concise Oxford Dictionary.

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- communal: they are held by a group of individuals;
 - state: they are held by a state agency or by the government on behalf of the public; and
 - the rights and responsibilities are not assigned.

Monitoring: "Intermittent (regular or irregular) surveillance carried out in order to ascertain the extent of compliance with a predetermined standard or the degree of deviation from the expected norm".²

Multi-user resource system: A resource system that is used by more than one user group. Uses can be conflicting, competing or complementary.

Natural Resource Management: The regulated and controlled use of natural resources.

Open Access Regime: Free-for-all; resource-use rights are neither exclusive nor transferable; these rights are owned in common but are open-access to everyone and therefore property of no one.³

Participation: The process that facilitates dialogue among all actors, mobilises and validates popular knowledge and skills, supports communities and their institutions to manage and control resources and seeks to achieve sustainability, economic equity, and social justice and maintain cultural integrity.

Planning: The process of gathering and analysing information for the purpose of achieving a desired objective.

Power: The ability to assert control or influence.

Property Rights: "Property is the result of a secure claim to a resource or the services that resources provide. Property rights exist in a variety of forms but most commonly as:

- state property, where secure claim rests with the government- as in a public forest or national park;
- private property, where the claim rests with the individual or the corporation; and
- common property or communal property, where individuals have claims on collective goods as members of recognised groups".⁴

Research: Critical investigation to discover new or collate old facts.

²Hellawell, J. M. 1991. Development of a rationale for monitoring. Pages 1 - 14 in F. B. Goldsmith, ed. Monitoring for conservation and ecology. Chapman and Hall. London.

³Berkes, F and M.T. Farvar. 1989. Introduction and overview. Pages 1-17 in F. Berkes, ed. Common property resources. Belhaven Press, London, United Kingdom

⁴ Gibbs and Bromley 1989:24

Stakeholder: Any party with an actual or potential interest in the economic, social or cultural use of resource. The interests or stakes of the various actors or stakeholders differ because of such things as tenure, ownership, history of use and pattern or type of use.

Stakeholder Analysis: "Stakeholder analysis refers to a range of tools for the identification and description of stakeholders on the basis of their attributes, interrelationships and interests related to a given issue or resource."⁵ Stakeholder analyses can help resource managers determine who should participate in management and how.

Stakeholder Identification The process of determining all the persons, groups or organisations that have an interest or stake in a resource, project, or programme. The information gathered through stakeholder identification is used in stakeholder analysis to differentiate among stakeholders based on their attributes.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Use: According to Borri-Feyerabend (1997:82), "Resource use systems can be described as sustainable if, over time, they maintain the natural productivity of these resources, the genetic diversity of the plants and animals concerned and the ecosystem functions of recycling nutrients, water, carbon, and oxygen"

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Appendix 2

DRAFT

MANAGEMENT AGREEMENT

FOR THE AUPICON FUELWOOD PROJECT

1. Introduction

The Aupicon project is part of the broader Southeast coast project in Vieux Fort, St. Lucia. The Southeast coast project aims to conserve and develop the natural resources on that coast, placing emphasis on increasing the economic status of resource users through sustainable income generating activities. The Southeast coast area was seen worthy of protection and in 1981 the Government of St. Lucia and the Eastern Caribbean Natural Resources Institute (ECNAMP), now the Caribbean Natural Resources Institute (CANARI), initiated this project.

The Mankôtè mangrove, St. Lucia's largest remaining wetland, is one of the ecosystems which needs protection within the Southeast coast. This mangrove is used extensively by a small group of people for the production of charcoal. As part of the effort to relieve the pressure off this useful ecosystem, it was decided to establish an alternative fuelwood source. With the efforts of the Forestry Department and the charcoal producers a 18.7 acre *Leucaena* plantation was established mainly for the production of charcoal.

The lands on which the fuelwood plantation is established were leased from the National Development Corporation to the Ministry of Agriculture for the Aupicon Charcoal and Agricultural Producers Group. A second portion (10.3 acres) adjacent to the fuelwood plantation was also leased for the purpose of growing agricultural crops.

The fuelwood plantation consists mainly of *Leucaena* which is the species harvested for the making of charcoal. Other tree species are also planted for the same purpose but on a smaller scale. This included *Acacia mangium* and *Gmelina*. Mahogany and Cuarina are on that same parcel and these were planted to test the performance of such species on shallow soils.

2. Purpose of the agreement

This agreement is being entered into by the Aupicon Charcoal and Agricultural Producers Group, the Department of Forest and Lands of the Ministry of Agriculture and the National Development Corporation, for the purpose of governing the use of land and fuelwood plantations at Aupicon, Vieux Fort, on an area covering 18.7 acres as shown on the attached map. This agreement cancels the previous agreements or leases entered into by these parties in relation to the same area, notably the leases of land to the Ministry of Agriculture for the fuelwood plantation (18.7 acres) and the

agricultural project (10.3 acres, see letter Ref. 01/01/08 dated 8 April, 1988, from the National Development Corporation to the Ministry of Agriculture). This agreement applies only to the management of the fuelwood plantation which occupies 18.7 acres.

3. Objectives

The objectives of the project are:

1) to contribute to the sustainable supply of fuelwood to the Aupicon and surrounding communities, and to improve the livelihood and income of members of the Aupicon Group;

2) to relieve pressure on the Mankòtè mangrove by providing an alternative source of fuelwood;

3) to document the experience in social forestry and to collect data on the performance of various fast growing timber species;

4) to share the experiences gained in social forestry with other forestry initiatives on the island and in the region.

4. Ownership and access

The lands as shown on the attached map, covering an area of 18.7 acres, shall remain the property of the National Development Corporation but shall be managed by the Aupicon Charcoal and Agricultural Producers Group. The Producers Group shall have exclusive rights and responsibilities for use of the land, as well as the use of the timber and other wood products from that land, under the terms and conditions stipulated in this agreement.

The land shall be used for the development and expansion on the plantation and will be devoted only to activities which support and complement the objectives of the project.

The Ministry of Agriculture and the National Development Corporation retain the right of access to the land at any time.

The Aupicon Group shall grant right of passage to owners and users of land located at the back of the project site.

5. Management activities

5.1. Harvesting

Harvesting of the fuelwood plantation shall be done by the Aupicon Charcoal and Agricultural Producers Group with the assistance of the

Department of Forest and Lands whenever necessary. Harvesting shall take place at any time during the year, on the condition that the Department of Forest and Lands 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 Department of Forest and Lands if climate 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 shall be no less than 5 centimetres in diameter and no less than 6 metres in height. The Aupicon Group shall use a proper method of harvesting which shall ensure the continued survival of the trees. The group shall decide on the method to be used for the production of the charcoal (metal kiln, pit, etc.).

5.2. Maintenance

The maintenance of the fuelwood plantation shall be the responsibility of the Aupicon Charcoal and Agricultural Producers Group, which shall 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 purpose of this project.

5.3. Monitoring

The Department of Forest and Lands shall 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, retorts 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.

The Aupicon Group shall be made aware of these activities before their commencement.

The Group shall assist the Ministry in its monitoring activities to the extent that it has the capabilities to do such.

5.4 Protection and enforcement.

The Aupicon Charcoal and Agricultural Producers Group shall 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 its rights as provided by the laws of the State of St. Lucia. In the event that 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.

6. Duration

The present agreement shall be for an initial period of five years. It can be modified at any time with the consent of all three parties. Extension or renewal of this agreement shall be deemed on the proper management of the plantation.

In the event that the management procedures described in section 5 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 shall 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:

Minister of Agriculture

Chairman, N.D.C.

President, Aupicon Group

Date:_____