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GRENADA CASE STUDY: THE LOBSTER FISHERY AT SAUTEURS

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in association with the
University of the West Indies
Centre for Resource Management and Environmental Studies (CERMES)
and
Marine Resources Assessment Group Ltd. (MRAG)



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Executive summary

This case is situated in the northern rural town of Sauteurs set in the agricultural parish of St. Patrick's in Grenada. It was selected as an example of an attempt to co-manage a valuable inshore fishery with fairly well defined resource and community boundaries, but at a location remote from the fisheries authority. The fisheries regulations of Grenada prohibit the use of nets for harvesting lobsters, and the use of trammel nets for any species. Prior to these regulations the fishermen of Sauteurs on the mainland, and Isle de Ronde offshore, used trammel nets for harvesting lobster. As the regulations were introduced the fishermen received reprieves from government to allow them time to switch to alternative gear on their own. However, trammel nets remained the primary gear for lobster harvest, with no evidence of alternatives being introduced by the fishers themselves.

In 2001, the government of Grenada decided to no longer tolerate illegal fishing with trammel nets, but wanted a collaborative phase-out to include the Fisheries Division introducing alternative and acceptable fishing gear. A co-management pilot project was initiated for this purpose. Although the co-management pilot project was reasonably well designed, its implementation period was unrealistically short for the objectives that were set. In particular, there was not enough time allowed for the acquisition of test fishing gear and the collaborative activities of gear trials that should have assisted in strengthening the relationships between the fishers and fisheries authority, perhaps whether they were successful or not. Joint activity may also have reduced the tensions between the parties that were evident at the start due to a history of mistrust and poor communication.

Because of the several problems experienced in implementing the project the government was forced to take a decision on whether to allow the illegal activities to continue or to announce its enforcement of regulations that had been defied for some time. Although the fishers had enough time over the years to devise their own solutions to the prohibition of their preferred fishing gear, they took no action. They considered government's inability to provide them with alternatives in a short space of time to be a breach of the co-management agreement. In many ways their objections were mainly to test the political and managerial strength of decision-makers. They accepted, and have apparently respected, the firm decision to enforce the net ban.

However, as a result of these, generally negative, interactions there seems to be little overall progress in the implementation of co-management for the lobster fishery based at Sauteurs in Grenada. Conditions for co-management seem not to be very favourable, but because of limited capacity amongst all stakeholders they need to cooperate to some extent because none can do well on their own. This scenario is fairly typical of Caribbean small-scale fisheries. The lessons on conditions for success have more to do with what to avoid, especially poor communication, and to beware the absence of a good social and cultural fit.

1 Introduction

The purpose of the Caribbean Coastal Co-management Guidelines Project is to ensure that mechanisms for implementation of integrated pro-poor natural resource management in coastal zones are developed and promoted. This is assisted by understanding the requirements for establishing successful co-management institutions for coastal resources under various conditions in the Caribbean. These ideals reflect the policy and objectives of the United Kingdom (UK) Department for International Development (DFID) on eliminating world poverty. The project is part of the Natural Resources Systems Programme (NRSP) Caribbean programme for Land Water Interface (LWI) production systems. This component of the NRSP has the purpose: “*Benefits for poor people in targeted countries generated by application of new knowledge to natural resources management in the land water interface*”. It entails:

1. An understanding of livelihood strategies;
2. An understanding of natural resource management opportunities;
3. Identification of the means to implement management opportunities relevant to the poor.

The project is a response to a September 2001 call for proposals from the NRSP to implement parts of the LWI logical framework (or logframe) (Box 1.1).

Box 1.1 Structure of call for proposals

Output 1: Improved resource-use strategies in coastal zone production systems developed and promoted

Activity 1.3: Mechanisms for implementation of integrated pro-poor natural resource (and pollution prevention) management in coastal zones developed and promoted

Sub-activity 1.3.1: Mechanisms for the improvement of sustainable livelihood outcomes for poor people living in coastal zones through integrated participatory resource management and prevention of pollution developed and promoted

Sub-activity 1.3.1, milestone (b): Understanding the requirements for developing successful co-management initiatives and mechanisms for promoting them

Target region: Caribbean

Source: DFID-Natural Resource Systems Programme

Project implementation is lead by the Caribbean Conservation Association (CCA) under its Coastal and Marine Management Programme (CaMMP). Project partners are the Marine Resources Assessment Group Ltd. (MRAG) of the UK and the Natural Resources Management (NRM) Programme of the University of the West Indies (UWI) Cave Hill Campus in Barbados where the CCA has its office. The execution period is 1 April 2002 to 30 June 2003 (15 months) with a budget of £87,112 (or approximately \$125,000 US dollars).

The Caribbean Coastal Co-management Guidelines Project seeks to ensure that people in the Caribbean, especially the poor, can effectively engage in successful partnerships with government for sustainable livelihoods in the context of well-managed coastal resources. The study addresses both the natural resource and human institutional aspects of co-management. Through a series of participatory investigations in case studies of conditions that favour, or do not favour, the co-management of coastal and marine resources at selected sites the project

derives guidelines for developing successful co-management in the Caribbean. Uptake is promoted by interaction with target institutions and potential beneficiaries, and wide dissemination of outputs. The project's main outputs are listed below.

1. Selection of co-management analysis research framework
2. Ecological and environmental assessments of the natural resource systems and their utilisation
3. Institutional, socio-economic, cultural, political and other human dimension assessments
4. Comparison of how the natural resource and human factors assessed in 2 and 3 favour or constrain the establishment of successful, pro-poor and integrated co-management
5. Development of regionally applicable guidelines on successful, pro-poor and integrated co-management in the wider Caribbean
6. Capacity of target institutions and beneficiaries for co-management built through project participatory processes

This case study report is intended for access and uptake by a broad readership. Readers are also guided to the project's newsletters, reports and published papers for further information. The information generated from this and other case studies is synthesised in a comparative analysis. Guidelines for successful co-management are developed from these outputs.

In the next chapter, the research framework and methodology are described, followed by socioeconomic dimensions of the case, including poverty. Resource system and human system institutional analyses precede descriptions of exogenous factors, incentives to cooperate and patterns of interaction. Outcomes and performance are analysed prior to the final chapter discussion and conclusions on the lessons learned about what conditions may favour successful co-management in this case.

2 Research framework

This section sets out concepts that guide the research based on previous work in coastal co-management around the world. It sets the stage for presenting the case study results.

2.1 Definitions and concepts

Definitions of co-management focus on sharing management responsibility and authority between government and stakeholders (e.g. Pinkerton 1989; McConney 1998; Brown and Pomeroy 1999; Pomeroy 2001; Berkes et al. 2001). The fundamentals of what co-management should be, and is in practice, have been extensively researched (Jentoft 1989; Kuperan and Abdullah 1994; Pomeroy and Berkes 1997). Co-management encompasses several possible arrangements that are often depicted as a scale constructed from the relative sharing of responsibility and authority between government and stakeholders (Pomeroy and Berkes 1997; Berkes et al. 2001) (Figure 2.1).

As for participation (Arnstein 1969), there are various positions on the scale, and authors use different terms for co-management and its degrees. For example, the Caribbean Natural Resources Institute (CANARI) uses "participatory management" (see extensive document list at www.canari.org). The terms participatory management or co-management are gaining popularity in Caribbean government and NGO circles, and among some resource users (Almerigi et al. 1999; CANARI 1999; CANARI 2000; CANARI 2001; CCA 2001). These concepts, however, are not always fully understood by their users. Conceptual and practical research issues therefore include the degrees of co-management and which terms to use.

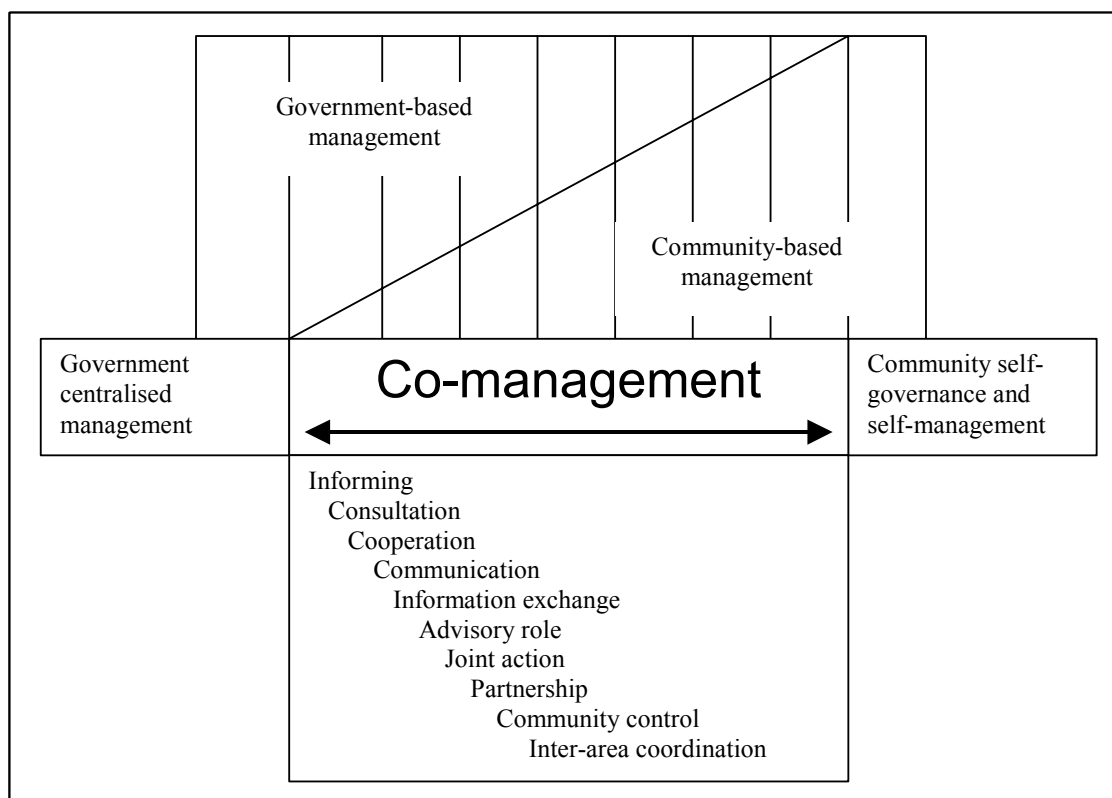


Figure 2.1 Sliding scale showing various degrees of co-management (based Pomeroy and Williams 1994)

Based on international and Caribbean literature it was determined that three degrees and labels would be appropriate (Figure 2.2). The first is “consultative co-management” which represents what is most common in several locations (Brown and Pomeroy 1999). People commonly use and understand the term consultation.

| | Consultative co-management | Collaborative co-management | Delegated co-management | |
|--|--|--|--|---------------------------------|
| <i>Government has the most control</i> | Government interacts often but makes all the decisions | Government and the stakeholders work closely and share decisions | Government lets formally organised users/stakeholders make decisions | <i>People have most control</i> |

Figure 2.2 Degrees and labels of co-management

Adapted from: ICLARM and IFM 1998

Next is joint action and decision-making. This is where several countries seem to be headed. The term “collaborative co-management” was preferred to “cooperative co-management” because it connotes stronger partnerships, and the use of “cooperative” may be confused with the formal organisation types of the same name (Kurien 1988; McConney et al.1998).

Third is “delegated co-management” that includes, but is not limited to, community-based management since national co-management structures are especially common in fisheries

management (Jacobs 1998; McConney and Mahon 1998). Few cases in the Caribbean appear to be at this level, but it is not uncommon in other areas of the world (Baird 2000).

Establishing successful co-management is seldom immediate. Like most participatory processes it takes time and careful tending. Pomeroy (1998) recognises three phases of co-management and describes the sequence of steps within these in some detail. A much-simplified version is in Figure 2.3.

| Pre- implementation → | Implementation → | Post- implementation |
|-------------------------|--------------------------------|-------------------------------|
| Realise need for change | Try out new management | Maintain best arrangements |
| Meet and discuss change | Educate people in new ways | Resolve conflicts and enforce |
| Develop new management | Adjust and decide what is best | Accept as standard practice |

Figure 2.3 Phases of co-management

Based on: Pomeroy 1998

Like cases in Africa (Normann et al. 1998; Sverdrup-Jensen and Nielsen 1999), the Caribbean is generally at the pre-implementation or early implementation phase (McConney and Mahon 1998; McConney 1998). A few situations such as the Soufriere Marine Management Area (Renard 2000) may be mature enough to be labelled post-implementation. A very significant consequence is that neatly comparing “before” and “after” conditions arising from a co-management intervention such as a discrete project will be less feasible in the Caribbean than other locations such as in Asia where much of the literature on methodology originates (e.g. Pomeroy and Carlos. 1997; Pomeroy et al. 2001).

2.2 Research framework

The International Centre for Living Aquatic Resources Management (ICLARM) and Institute for Fisheries Management and Coastal Community Development (IFM) (ICLARM and IFM 1998) developed the methodology referred to above for the African and Asian cases (Figure 2.4).

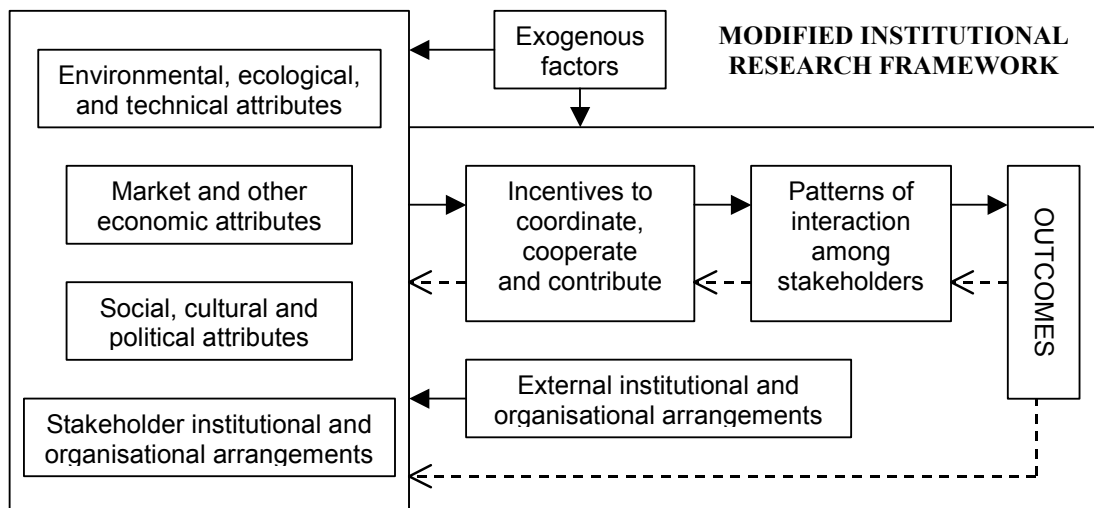


Figure 2.4 Modified ICLARM/IFM Institutional Analysis and Design Research Framework

The main analyses conducted within the framework are in Box 2.1. They are reflected in the logical framework for this project in terms of the assessments to be performed. Institutional analyses are of critical importance in researching co-management (Renard 1991; Noble 2000).

Box 2.1 Main analyses included in the framework

1. Institutional Arrangements Analysis: This component links contextual variables characterizing key attributes of the resource (biological, physical) and the resource users (technology, market, social, cultural, economic, political) with the management institutional arrangements (rights and rules). The contextual variables are each composed of a number of attributes. A causal relationship exists among and between the contextual variables, the institutional arrangements (the focus of the analysis) and the resulting transactional (action) situations. The institutional arrangements and the contextual variables affect the actions of the resource users and authorities responsible for fisheries management by shaping the incentives and disincentives they have to coordinate and cooperate in resource governance, management and use; the incentives, in turn, shape the patterns of interaction and behaviour between the co-management partners, i.e. the types of co-management arrangement established and the way it functions.

2. Co-management Performance Analysis: The co-management arrangement results in outcomes. These outcomes will, in turn, affect contextual variables as well as behaviour of resource users, other stakeholders and public authorities. Time is a critical element. All the contextual variables can change through time. This may cause change in institutional arrangements which, in turn, affect incentives, patterns of interaction and outcomes. The outcomes of co-management institutional arrangements can be evaluated in terms of e.g. management efficiency, equity, and sustainability of resource utilisation.

3. Characteristics of Successful Co-management Institutional Arrangements: The most important aspect of this analysis is the specification of what conditions and processes bring about successful long-enduring, fisheries co-management arrangements. From the analysis we can identify a list of principles and propositions about conditions and processes.

Source: ICLARM and IFM 1998

This project pays particular attention to integrated and pro-poor coastal management. Since poverty concepts may be new to some readers, a few words on the topic are warranted.

2.3 Pro-poor perspectives

DFID-NRSP (2001) emphasises the importance of a systems perspective on what is poverty and pro-poor, and how to address them. The concepts of poverty and the development of pro-poor strategies are complex social, cultural and economic issues (Centre for Development Studies 2000). Eradication or alleviation of poverty is often accompanied by attention to sustainable livelihoods (Carney 1998; Geoghegan and Smith 1998; Dorward et al. 2001).

In the Asia-Pacific region the focus is on alternative livelihoods since coastal resources are severely depleted and habitats are degraded. In the Caribbean, resources are often still adequate for use to be sustainable if supplementary livelihoods are found to ease the pressure without completely changing lifestyles. For example, fishermen displaced by MPAs in Belize are being re-trained to be fly-fishing and nature tour operators to obtain additional income in the tourist season, and facilitate increased compliance with fishing restrictions (Heyman and Hyatt. 1996; Heyman and Graham 2000).

Although the above initiative may be considered a pro-poor strategy it does not necessarily mean that it was specifically intended and designed as such. Poverty and pro-poor orientation by objective and implementation were not prominent in a recent institutional characterisation of Caribbean MPAs (Geoghegan et al. 2001). Statements such as improving welfare and the quality of life, without explicitly mentioning poverty, are more typical of planning documents for small-scale fisheries in the region (e.g. Government of Barbados 1993). Research must note direct and indirect, positive and negative impacts on poverty by both public and private sector initiatives. The attention of Caribbean governments to poverty has been relatively recent in most places. Poverty assessment studies from the mid-1990s to the present provide fairly current data for most countries (e.g. Kairi Consultants 1999).

Institutional analysis provides insight into how social and economic institutions interact with each other and contribute either to the perpetuation or reduction of poverty. Poverty in the Caribbean is often associated with youth and female-headed households, making age and gender important variables (Brown 2001). There are chronic, structural and seasonal poor in the Caribbean, with fishers as an example of the latter (Brown 2001). Fishers and other coastal resource users in the informal sector may easily slip through the net of employment surveys.

Often critical to the success of co-management is the extent to which community-based organisations can engage in poverty eradication and alleviation (Centre for Development Studies 2000). This encompasses empowerment and the concept of “voice”. Pro-poor strategies must address causes that operate at the micro as well as the macro levels, and ensure that government policy effectively engages these causes either directly or by creation of an environment that facilitates positive action by other entities (Brown 2001).

3 Case study overview

The six selected case studies, two each in Barbados, Belize and Grenada, are summarised in Appendix 1. This case is situated in the northern rural town of Sauteurs set in the agricultural parish of St. Patrick’s in Grenada. It was selected as an example of an attempt to co-manage a valuable inshore fishery with fairly well defined resource and community boundaries, but at a location remote from the fisheries authority. The fisheries regulations of Grenada prohibit the use of nets for harvesting lobsters, and the use of trammel nets for any species. Trammel nets are unselective fishing gear that entangle the catch. They are prohibited in most eastern Caribbean countries. Prior to these regulations the fishermen of Sauteurs on the mainland, and Isle de Ronde offshore, used trammel nets for harvesting lobster. As the regulations were introduced the fishermen received reprieves from government to allow them time to switch to alternative gear on their own. However, trammel nets remained the primary gear for lobster harvest, with no evidence of alternatives being introduced by the fishers themselves.

In 2001, the government of Grenada decided to no longer tolerate trammel nets, but wanted a collaborative phase out to include the Fisheries Division introducing alternative and acceptable fishing gear. A co-management pilot project was initiated for this purpose. The project informed fishermen about the Code of Conduct for Responsible Fisheries and the Grenada draft fishery management and implementation plans for lobster. A brief co-management agreement was signed between the fisheries authority and Sauteurs fishermen.

Acquiring and demonstrating alternative fishing gear proved logistically problematic, and no new gear types were introduced during the main phase of the project. However, there was mutual interest to continue working together. So, as follow-up, the government of Grenada sent two fishers with a fisheries officer to Trinidad to get training in the use of lobster pots. Enforcing the

ban on trammel nets, and introducing lobster pots, continues as a government-led co-management effort.

The case involves poorly organised fishermen wielding considerable power to defy fisheries management regulations by continuing to use illegal trammel nets to harvest lobster. The fisheries authority has limited capacity. Government introduced co-management in a project as a means of interaction to promote compliance with the local laws and the principles of responsible fishing operations reflected in the international Code of Conduct for Responsible Fisheries. Conditions for co-management seem not to be very favourable, but because of limited capacity amongst all stakeholders they need to cooperate to some extent because none can do well on their own. This scenario is fairly typical of Caribbean small-scale fisheries.

Other regional similarities, in the context of integrated coastal management, include the government having plans to introduce new developments to this less prosperous parish that take advantage of, but may also damage, its attractive coastal natural resources. A major project in golf real estate and tourism is already underway in the midst of a national park with coastal protected areas. There is also mention of Sauteurs becoming a more significant port. Stakeholder groups related to fishing include the government Fisheries and Cooperatives Divisions and the St. Patrick's Fishermen's Cooperative. However, many more individual stakeholders and interested parties have roles in this case from which we hope to extract generally applicable guidelines for successful co-management based on what does or does not seem to work in practice. The case illustrates issues of simultaneously attempting to introduce fishery co-management and economic development in a rural coastal area. Several Caribbean countries face similar challenges.

4 Research methods

The general action research methods used in the case studies include.

- ◆ Document analysis
- ◆ Questionnaire surveys
- ◆ Semi-structured interviews
- ◆ Focus groups, informants
- ◆ Workshops and seminars
- ◆ Periodic e-mail, newsletters
- ◆ Transfer of skills and concepts

The cases in this project are mainly in pre-implementation or early implementation phases of co-management. Emphasis is on understanding the conditions and factors for successful co-management as perceived by the stakeholders at the research sites. Because an objective of the project is uptake of co-management concepts and practices that may lead to success, there is active promotion of co-management through frequent engagement of the stakeholders and target institutions in the research. This is participatory action research.

The Sauteurs case study was implemented partly in conjunction with a co-management pilot project entitled *Responsible alternatives to trammel nets for lobster fishing at Sauteurs and Isle de Ronde* that started in October 2001 and finished in August 2002. The pilot project letter of agreement between the Fisheries Division of the government of Grenada, Sauteurs fishermen's group, Agency for Rural Transformation (ART) and the Coastal and Marine Management Program (CaMMP) of the Caribbean Conservation Association (CCA) also served to set up the partnership for this case study of the Caribbean Coastal Co-management Guidelines Project.

The general objective of the pilot project was to build capacity in the fishing industry and the Fisheries Division for meaningful participation in comanagement. The project was designed to:

- ◆ Increase awareness of responsible fishing practices and the problems of trammel net use
- ◆ Identify and promote acceptance of alternatives to using trammel nets for lobsters
- ◆ Strengthen or build institutional arrangements that favour co-management of the fishery

Initial scoping revealed that very little documentation existed on the lobster fishery at Sauteurs, the fishers or the town. Informal and semi-structured interviews with officials and fishers provided most of the background information. Early public meetings and a pre-test suggested some reluctance to participate in intensive questionnaire surveys, particularly on household or personal issues. Minimal use was made of surveys. Extensive use was made of informal meetings at the open-air market and workshops at a small dance hall and a public school in the town, which is a 90-minute commute from the capital. Mild conflict between the fishers and fisheries authority was noted from inception and the project took pains to remain neutral and objective, while promoting the dialogue necessary for co-management. Fieldwork at sea was also intended to demonstrate the benefits of collaboration in data collection. However, logistical constraints prevented this from being implemented.

The pilot project produced the following documents in connection with this case study:

- ◆ Report of the Workshop on Responsible Fisheries Alternatives
- ◆ Report of the Workshop on Leadership for Fishing Industry Organisations
- ◆ Interim progress report on implementation of the co-management pilot project
- ◆ Report of the Workshop on Negotiation and Conflict Management for the Sauteurs lobster fishery
- ◆ Recommendations for the completion of the Grenada fishery management plan for lobster
- ◆ Description of the trammel net lobster fishery at Sauteurs, Grenada
- ◆ Final progress report on implementation of the co-management pilot project

The following sections do not segregate findings by project. They are combined and integrated for the purpose of analysis, starting with resource assessment.

5 Resource assessment

Figure 5.1 illustrates a framework for resource assessment, putting the resource in the context of integrated coastal management, and noting the linkage between harvesting and marketing that partly determines livelihood strategies.

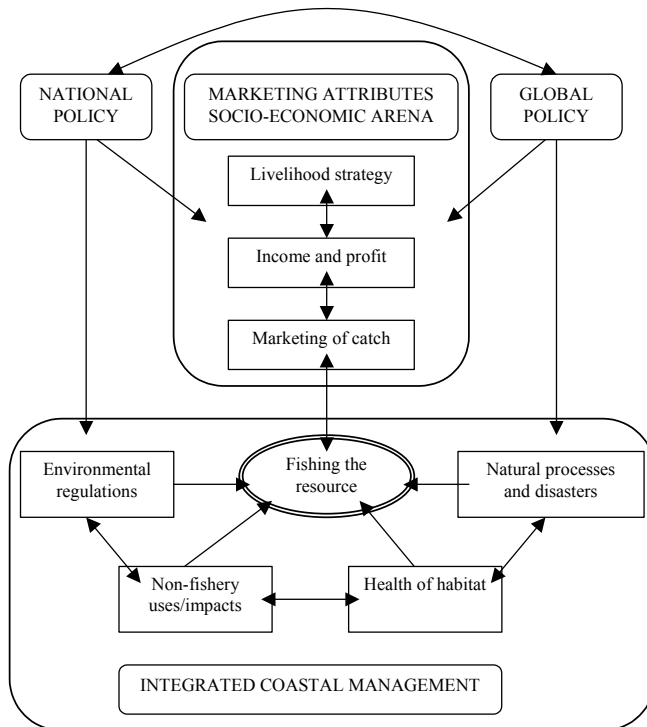


Figure 5.1 Framework for resource assessment

5.1 Geography

Grenada is a small island developing state (SIDS) in the eastern Caribbean. It comprises the main island by that name, the inhabited islands of Carriacou and Petit Martinique, and several uninhabited smaller islands mainly off the northeast and southeast coasts. The country is located in the Caribbean Sea between latitudes 11.5 and 12.5 degrees North and longitudes 60 and 61 degrees West (Figure 5.2). The main island of Grenada has a width of 18 km, a length of 34 km, a coastline of about 121 km, an area of 340 km², and its highest point reaches nearly 900 m. Carriacou, located 24 km to the northeast of the mainland, is much less mountainous and has an area of 34 km². Petit Martinique is 2.3 km² and lies east of the northern part of Carriacou.

Grenada has a relatively large insular shelf area of 3,100 km². The shelf is narrow on the western coast, extending from shore less than a kilometre to 200 metres depth. From the southeast to the northeast, the shelf varies in width between 4 and 12 km, and extends to the west-southwest in a 19 km wide tongue for about 32 km. Depths on the shelf vary from 40 – 80 m with average depths of 30 - 40 metres. In the Grenadines the shelf is from 20 - 60 metres deep over the greater part of the area. Ocean currents generally flow from the east-southeast towards the northwest.

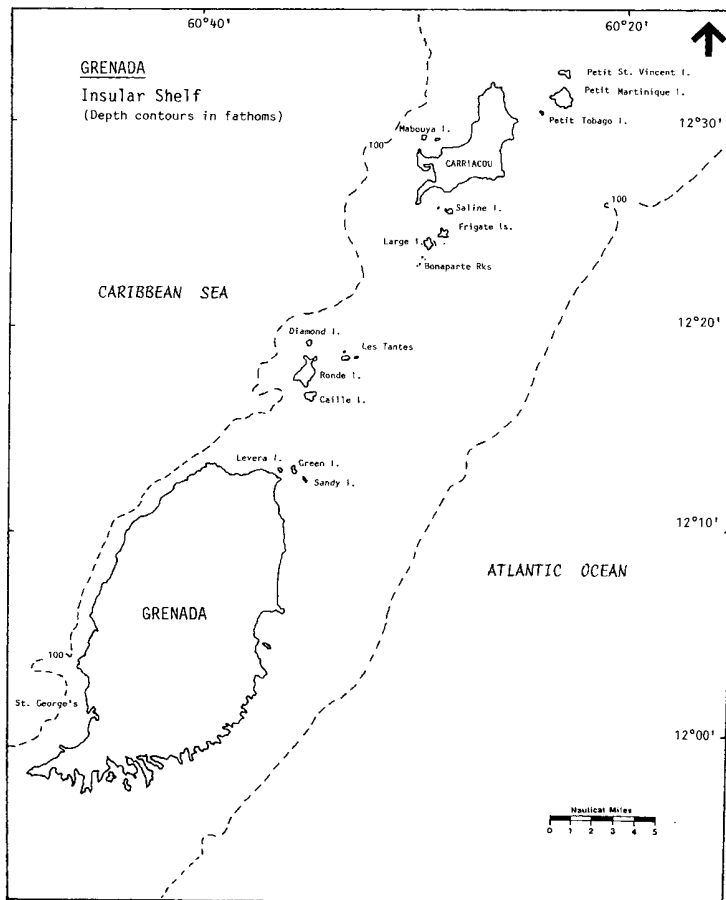


Figure 5.2 Grenada and the Grenadines shelf

Grenada is divided into parishes, the most northern being St. Patrick's. This parish's key natural resources are its forests, rivers, beaches, lakes, mangroves, coral reefs and offshore islands. Environmental problems include planting on steep slopes, soil erosion, damming of rivers, squatting, improper waste disposal and over use of agro-chemicals (Jessamy 1999). St. Patrick's has about a dozen small communities. The beaches are popular with residents, especially on weekends, and the area's tourism potential has recently received considerable attention. The Levera National Park was established in 1994. It comprises 450 acres around the Levera Pond, a large mangrove swamp and one of the most important wildlife habitats on the island, and three ecologically important offshore islands. Levera is promoted as Grenada's most scenic and spectacular coastal area, with a bird sanctuary, turtle nesting beaches and sites of historic interest.

Although Grenada was under British rule from 1783 to independence in 1974, early French influence remains in the names of Grenadian people, places, objects and activities including those related to fishing. "Le Morne des Sauteurs" (Leapers Hill) is the promontory where 40 Caribs being pursued by the French in the mid-1600s found themselves on the edge of a sea cliff, jumped off and perished. The nearby settlement became known as Sauteurs, the location of this case study.



Figure 5.3 Sauteurs is located on the north coast of Grenada

The northern town of Sauteurs has a population of about 700 people (Figure 5.3). It offers a typical variety of services, commerce and amenities. Most businesses are owned by the residents including gas station, tyre repair, hardware, agricultural supplies, feed, general goods, vegetable market. There are primary and secondary schools, a community and training centre, credit union, cooperative and commercial bank. Farming, rather than fishing, is the main economic pursuit of the Sauteurs area, as it is for St. Patrick's generally. Fishery participants live in Sauteurs or its outskirts.

5.2 Caribbean spiny lobster fisheries

The Caribbean spiny lobster (*Panulirus argus*) is widely distributed in the western central Atlantic, supporting important fisheries with total reported landings of between 27,000 and 30,000 metric tons per annum over the last decade, valued at hundreds of millions of dollars. However, recent assessments undertaken under the auspices of the Western Central Atlantic Fisheries Commission (WECAFC) have indicated that the resource is being fully or over-exploited over much of its range (Cochrane and Chakalall 2000). In most countries there is an urgent need to control or reduce fishing effort for the species. Traps, gillnets and divers (with and without breathing devices) are the most common fishing methods. The top 12 lobster producing countries employ more than 40,000 lobster fishers (Cochrane and Chakalall 2000).

Spiny lobster occurs in water up to 90 m deep in sheltered habitats such as coral reefs and rocky areas. The size at first maturity appears to vary with location, estimates of the size at 50% maturity being around 80-90 mm carapace length (CL) (Arce and de León, 2000). With a 6 to 10 month ocean pelagic larval dispersal stage, many localities may depend on recruitment from

other areas, and perhaps other countries. Poor quality catch data and inadequate definition of stocks have hampered assessments by the *Ad hoc* Working Group on Spiny Lobster. The group was formed by member countries at the Ninth Session of the Western Central Atlantic Fishery Commission (WECAFC) in Saint Lucia in 1999. Its formation and work to date represents an important starting point for an effective regional organisation or arrangement for managing spiny lobster (Cochrane and Chakalall 2000; FAO/WECAFC 2001a and 2001b).

5.3 Sauteurs fishing area

The trammel net fishery for spiny lobster takes place on the northern shelf of Grenada through to the island of Carriacou. Several other fisheries also take place in the area (Figure 5.4).

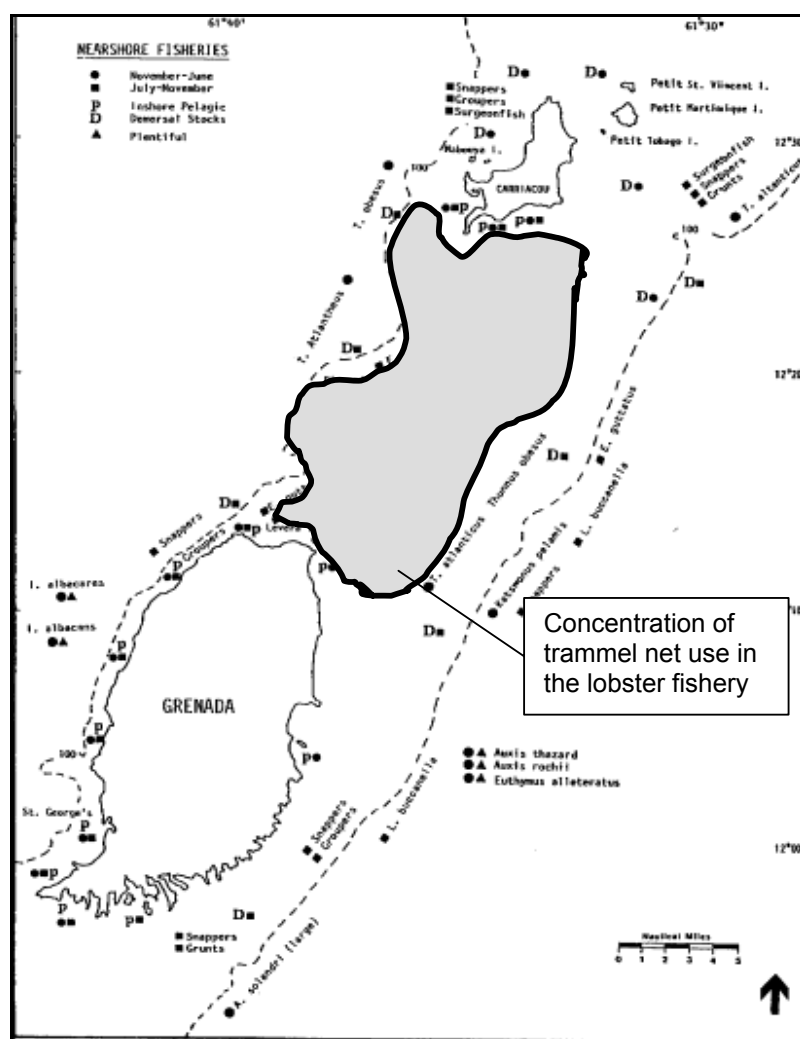


Figure 5.4 Location of main trammel net fishery for spiny lobster

5.4 Fishing methods

Traditionally, the spiny lobster was captured on the northern shelf and other locations by free-diving using loops. This practice still exists, but SCUBA diving is generally now the norm.

Lobsters are an incidental catch in fish traps, but use of this gear has declined. The other gear, now used illegally, is the trammel net. Before trammel nets, lobster fishing at Sauteurs was a minor activity. According to Phillip (1996 and 2002), upon whose work most of this section is based, fishers from St. Vincent and the Grenadines introduced trammel nets to Grenada in the early 1980's. The nets were later obtained from Trinidad and Tobago.

A trammel net consists of three walls (panels) of webbing suspended from a float line and attached to a lead line. It fishes passively at the bottom as an entangling net. The loosely hung central panel is of smaller mesh than the outer two. So, in addition to functioning as a gillnet, it entangles fish in the pockets formed as the central panel is pushed through either of the outer ones. Whereas a gillnet is fairly size selective, this entangling action is very unselective and a wide size range of organisms are caught in addition to entangling inanimate objects such as coral rock. The more body projections an animal or object has, the greater is its chance of entanglement.

The net used by the Sauteurs fishers varies from 100m to 150m long and is approximately 1m to 1.5m deep. In the first nets the two outer panels had a stretched mesh size of 4 to 6 inches, while the inner panel was 3 inches and much wider than the outer panels so that it overlaps between the larger meshes of the outer panel (Phillip 1996). Fishers now claim to use 4-inch mesh on the inside and 12-inch outer panels that make entangling more effective. Many fishers make and repair the nets themselves with twine imported from Trinidad and Tobago. Fishers previously obtained nets from Martinique that were 2.5 inches inside and 12-16 inches on the outside. They switched to 4 inch inside mesh partly because they could buy more netting per dollar at this size. Because the nets are illegal to use, fishers do not display them openly.

The net is heavily leaded so that it remains on the bottom. The upper part has floats to keep the net upright in the water. A fly-buoy may be used to mark the position of the net on the surface. Setting the nets in channels of 20-80m water depth where strong currents run is common. It is usually set in the daytime during slack current (preferably in the morning), floating upright. When the current begins to run, the water pressure forces it to lie flat on the bottom. In this position, the net entangles much of the substrate with which it comes into contact. As a result, the net may damage a strip of bottom 100m by 2m each time it is set and hauled, and it may also be damaged in the process.

Nets soak for 18–24 hours, to be retrieved and set again the following day. This is done on average five days a week. They may soak unattended on weekends during the open season for spiny lobster (from 1 September to 30 April of every year). If there are low catches towards the end of the lobster-fishing season, or if another type of fishing is particularly lucrative, nets are left to soak longer. This results in more dead fish in the net. Some say that this death and decay causes live fish of the same species to move from the area. Most of the fish caught in the net spoils quickly, baits the net, and attracts lobsters. If nets soak too long the loose stones rolled in by the current make them too heavy to haul and liable to tear. Long soaks also make lobsters weak so that they must be sold right away.

5.5 Fishing boats

A relatively small number of boats deploy 2 or 3 trammel nets each (Table 5.1). Two fishers usually haul the nets, an activity described by all as very hard work. The entangled coral, sponges, fish, lobsters and other organisms are removed as it comes aboard. Scarring on the sides of the small (<7m) outboard-powered wooden boats from the "debris" pulled up with the nets is evident.

Table 5.1 Boats and trammel nets at Sauteurs and Carriacou from 1996 to 2001

| Year | Sauteurs | | Carriacou | |
|------|----------|------|-----------|------|
| | Boats | Nets | Boats | Nets |
| 1996 | 9 | 20 | 8 | 17 |
| 2001 | 9 | 20 | 5 | 15 |

(Source: Phillip 2002)

The efficiency of the trammel nets reduces the time a vessel needs to remain at sea, saving fuel and labor costs compared to alternative gear such as traps. With time to spare, many of the fishers also use other fishing methods. During the closed season for lobster, bottom fishing (for snappers and groupers) is prevalent, while beach seining is an alternative or supplement all year round. The fishers typically switch fisheries depending on a number of factors including regulations, prices, catches and weather (Table 5.2).

Table 5.2 Seasonality of fishing at Sauteurs

| Type of fishing | J | F | M | A | M | J | J | A | S | O | N | D |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lobster (diving and illegal nets) | | | | | | | | | | | | |
| Finfish diving (SCUBA mainly) | | | | | | | | | | | | |
| Beach seine (sometimes offshore) | | | | | | | | | | | | |
| Handline (vertical multi-hook line) | | | | | | | | | | | | |
| Palangue (bottom longline) | | | | | | | | | | | | |

Recently, the areas of Sauteurs and Isle de Ronde have featured prominently in violent drug-related activity. Fishers have been implicated as being involved and also as innocent bystanders. The use of the area for drug transshipment is not new, but the recent violence may have an impact on fishing patterns in the future. This could potentially impact all types of fishing.

5.6 Catch

Fishers report that boats will typically catch 30-60kg of lobster per week in a season of 16-24 weeks. Between 6 and 10 boats are usually operating. So landings of about 20 metric tons per season of whole lobster from Sauteurs and Isle de Ronde are possible. Official national lobster statistics are shown in Figure 5.5, with recent seasonal landings for Sauteurs (Figure 5.6) and Grenville (Figure 5.7).

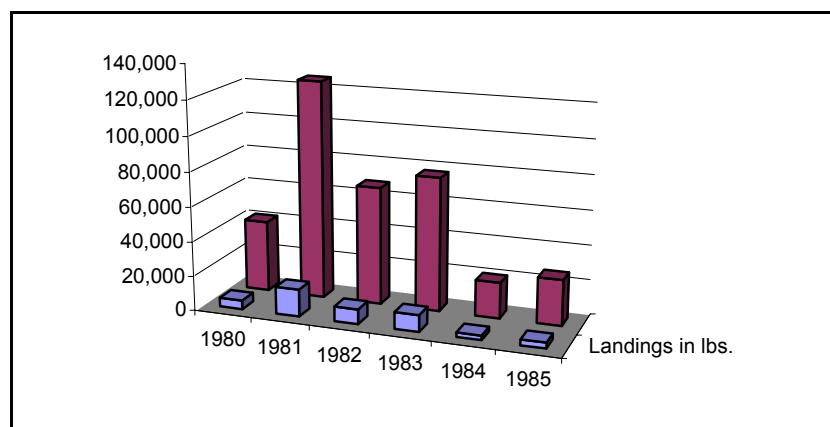


Figure 5.5 Official records of national lobster landings and value

(Source: Fisheries Division)

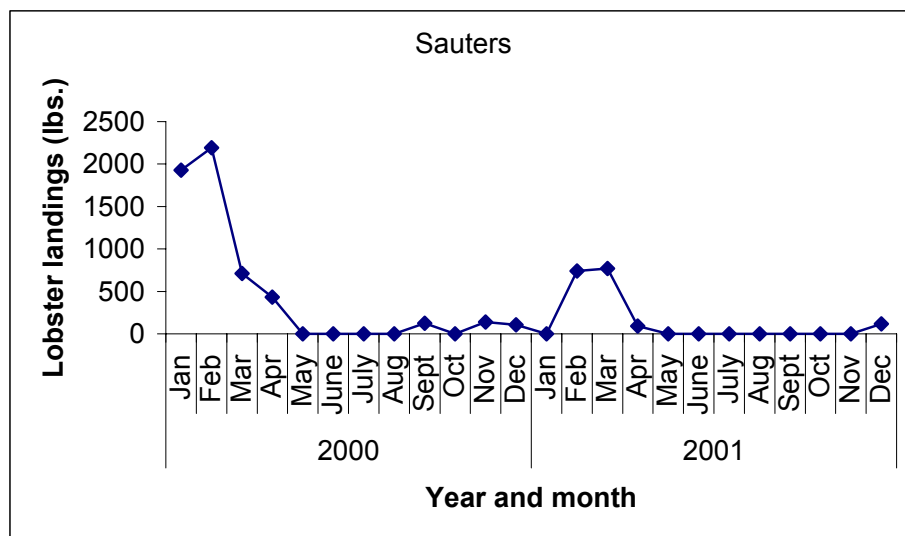


Figure 5.6 Lobster landings recorded at Sauteurs for 2000 and 2001 (Source: Fisheries Division)

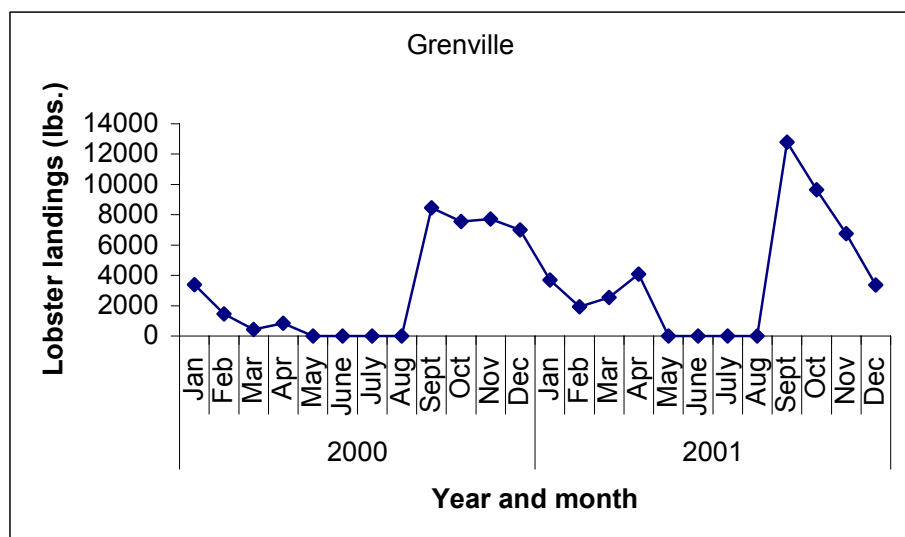


Figure 5.7 Lobster landings recorded at Grenville for 2000 and 2001 (Source: Fisheries Division)

5.7 By-catch and discards

Information on by-catches and discards is sketchy and sometimes conflicting as most fishers wish to deny that trammel nets are harmful to the habitat and wasteful of fishery resources. However, some fishers admit to the damage the trammel nets are known generally to cause. Some fisheries officers have witnessed high proportions of wastage, although the contents of the nets have not been systematically recorded. The nets apparently entangle a large number of fish species of limited commercial value, sponges, algae and small crustaceans. They are said to break off large amounts of hard coral and soft coral (gorgonians) while rolling on the bottom and being pulled to the surface. Fishers complain of the hard work of pulling the nets and

cleaning them of unwanted items. Fisheries officers report that the only common species not yet observed in a trammel net is the octopus. Much fish is discarded as being not fit for human consumption. Hinds are the most valuable fish discards. Turtles, rays and sharks are also killed. Fishers report that net damage, from rocks and large fish including sharks, is often severe and occurs frequently, making the nets a high-maintenance gear.

5.8 Local ecological knowledge

According to fishers, the main trammel net fishing areas are characterised by rocky bottom featuring live coral outcrops and patches of sand. Currents in the area, especially in the channels between islands, are reported to be swift. There are areas of shallow water coral reef and seagrass beds near islands. These reported features correspond well with published charts, and in more detail since fishers essentially sample the sea bottom when they lift their nets.

Fishers have good knowledge of the lobster reproductive cycle and its correlation to the closed season. Most fishers report no distinct trends in lobster catches, and note that large individuals are still common in comparison to other fished areas in Grenada such as around Grenville. Some recognise that lobster fishers in general have to go further to harvest, venturing further north in to the waters of St. Vincent and the Grenadines.

The types of knowledge possessed by Sauteurs fishers are common to most fishers, scientists and fisheries officers concerned with lobster fishing. Because the nets are used illegally, fishers have more detailed information on their operations than do the official sources. However they are reluctant to share this information since it is likely to confirm that the nets are undesirable and so result in stricter enforcement of the law, or stiffer penalties upon conviction. Fishers say that the trammel net is not a preferred gear, but is the only efficient one they know for lobster that can be used from small boats and by those who cannot dive.

5.9 Lobster fishing in adjacent areas

There are only 2 trammel net fishers regularly on Isle de Ronde. Petit Martinique has lobster dive specialists, but Carriacou tends to have generalists. About 15 fishers were involved in the Carriacou trammel net fishery that stopped about 2 years ago. Fishing took place up to 6km off of the islands. Nets 30-100m long with 4 and 12-inch mesh yielded about 50kg of lobster per week including large individuals. Carriacou fishers report that trammel nets experienced more than 50% discards of fish and other marine life. They stopped using trammel nets because they were bad for the environment and government restricted their use (Kenroy Noel pers. com.). Carriacou fishers now use single panel 4-5 inch mesh nets for fish and lobster that some also now beginning to regard as harmful.

Fishers recognise that they have to go further for lobster now than they did a decade ago. Grenada divers are coming north past Carriacou and going as far as Canouan which is across the boundary. Lobsters are reportedly scarce around Grenville from which divers head north along the east coast, and much of the catch from Sauteurs is trucked to this larger market and sometimes included in the catch statistics for this site.

5.10 Alternatives to trammel nets

More responsible alternatives to the trammel net were sought during and after the co-management pilot project, but no conclusions were reached that lead to the adoption of new gear. The option of deleting or suspending the regulations prohibiting use of trammel nets for lobster, in order to thoroughly evaluate the performance of this gear, was rejected by the

fisheries authority and not discussed with fishers. The fisheries authority felt that the prohibition was justified based on observation, experience and the enactment of the same rule in other neighbouring countries. It was not felt necessary to systematically document and evaluate the alleged damage caused by the trammel net even though there were some arguments that the gear was not as harmful as believed (Gobert 1992). Also, changing the regulations would suggest that the government was unsure of its fisheries management measures, and this could lead to other challenges of authority.

It was agreed at a meeting between the Sauteurs fishers and attending fisheries officers that it would be worthwhile to try the single panel nets (gillnets) being used in Martinique for lobster as an alternative to the trammel net. Although not favoured by the fisheries officers, the resistance of the fishers to traps was clearly articulated, and it was felt that empirical evidence on the single panel net would be useful. The fisheries regulations allow authorised experimental fishing using prohibited gear. This authorisation was issued along with an outline of how the fishers and fisheries officers would collaboratively conduct the test fishing. The fishers would supply catch and by-catch data, and the whole experiment would be jointly evaluated. A small working group of fishers and fisheries officers was formed to oversee this activity. These were part of the co-management agreement.

A senior ministry official indicated that funds in the government's budget could be used to purchase lobster traps that would be tested at the same time. Because it was clear that the fishers were continuing to use the illegal trammel nets, and the fisheries authority would not wish to be seen conducting experimental fishing alongside illegal fishing, it was agreed to supply each of the ten trammel net boats with a set of experimental nets in order to focus their attention on competitively testing the alternative gear. The window of opportunity was the three remaining months of the lobster season.

Unfortunately the fisheries authority had delays and difficulty in obtaining nets from Martinique. They arrived a few days before the end of the lobster season. One of the more experienced fishers was given a net to gear up and fish. This he did without monitoring or other involvement from the Fisheries Division. He reported that the net did not perform, caught nothing of value and was damaged in the process. In a public meeting to evaluate the event he recommended changes to the gear design and was willing to try it again in closer collaboration with the fisheries authority. However, due to the lobster closed season no further action could be taken to experiment further with the single panel net. Funds were not made available by government for the fisheries authority to purchase the fish traps. In conclusion, the pilot project gear trials were aborted without any useful results.

Following a decision by government to enforce the prohibition of trammel nets, a fisheries officer and two fishers went for training in Trinidad in the construction and operation of lobster pots. The fishers who were trained overseas have made and deployed about a dozen pots, but there are no results yet from this exercise in which the fisheries authority is not closely involved in these gear trials. For several weeks the fisheries authority has been in the process of organising a training course for the remaining fishers to learn how to construct and use the pots. The previously trained fishers are willing to share their knowledge, but express doubt that the fisheries authority will provide the support needed to assist in the gear making and testing since delays have been experienced in supplying the pot construction materials. Some fishers claim that the government is stalling to avoid expending funds on assisting them further. Government representatives deny this, and tension persists.

6 Socio-economic attributes

National to local level social and economic attributes are examined in this section.

6.1 Agriculture in the economy

The agricultural sector, of which fishing is a part, plays important social and economic roles despite its declining contribution to income, employment and output. According to government's medium term economic and social review for the year 2000, and its economic strategy for 2003-2005, the economy of Grenada recorded negative growth of 3.4% in 2001 following positive growth of 6.6 % in 2000 (Ministry of Finance, Planning and Development 2001 and 2002). Poor performance in 2001 reflected reduced economic activities in agriculture, manufacturing, tourism and construction. The agricultural sector recorded negative growth of 3.3%. Output was down by 23.1% relative to 2000 due to the reduction in production of agricultural crops, but fish production grew by 32.1%. Agriculture's share of Gross Domestic Product (GDP) in 2001 remained virtually unchanged at 8.2 % relative to the previous year, thanks to fishing.

6.2 Contribution of fishing

On average, fishing constitutes 15% of agriculture and about 1.5% of total GDP (Rennie 2002). Production of fish in 2000 was estimated to have grown by 3.4% following a decline of 4.7% in 1999 due to fish kills. Export of fish, that has averaged about 200 metric tons valued at around EC\$9 million (US\$1 = EC\$2.67), rose by 12.0% in 2000. Importation of fish and fish products is around 300 metric tons valued at EC\$5 million (Rennie 2002). Fishing has recently been one of the few positive performers in the agriculture sector, and makes an important contribution to nutrition and food security.

Income and employment generation constraints exist in fisheries as shown in Box 6.1 but, perhaps mistakenly, the blame is put mainly on fishers' attitudes while solutions are said to lie in infrastructure development (Kairi Consultants 1999).

Box 6.1 Limited income and employment generation in fisheries

Causal Factor:

Ability of some fishermen to do well from selling on external markets, but there are limited arrangements for mobilising resources for sustained upgrading of industry.

Maintaining Factor:

Short-term outlook of fishermen prevents development of their communities

Reducing Factor:

Marketing and port facilities for fishing have been improved

Source: Kairi Consultants 1999

6.3 Fisher profile

Over 95% of Grenada's population of around 100,000 people is of African or mixed (mainly African-European) descent. About 60% of the people are Roman Catholic, but other denominations are locally significant. Participation in the Grenada fishing industry in general, and the Sauteurs lobster fishery in particular, is fairly homogenous. In Sauteurs the lobster

harvesters are exclusively male and most of the boat and trammel net owners are fisher captains (refer to fishery description). Their age range is fairly wide (about 20-70 years).

Most of the lobstermen have fishing as their only or main occupation, typically switching between fisheries according to seasonality of target abundance or availability, and compliance with the fisheries regulations. Fishing is their main source of income, and lobster is the most lucrative catch. Isle de Ronde and surrounding islets are known to be transit points for illegal drug trafficking. Fishers have been implicated as participants and victims in this illegal trade that resulted in the shooting death of one lobster fisher and disrupted fishing for several weeks during the study period. However these problems have not been significant enough to suggest that Sauteurs has a “drug culture”.

Rennie (2002) notes that most fishers come from lower socio-economic classes and throughout the island close to 90% have only primary school formal education. He raises the latter as a major problem resulting in inability to properly manage fishing enterprises as businesses and an obstacle to owning their own boat, especially as the size and capital investment increases. Although nearly 90% of fishers own their small (5m) open boats this decreases to about 30% for the offshore (>12m) vessels. In his sample from three parishes, over 50% of fishers surveyed were single or lived in common-law relationships, and in about 25% of cases a member of the household assisted in fishing or fish marketing activities.

According to residents, fishing seemed more important to Sauteurs when the jetty and fish market were in the middle of the lower town. The old jetty fell into disrepair, it was removed, and another was built outside the town centre along with a small fish market. Many people now do not go to the fish market located at the western edge of town, but get fish (not lobsters) delivered to them by vendors. The fish market is mainly a place concerning those directly involved in fishing, and a few customers, rather than a community gathering-place. Vendors and consumers sparsely populate the nearby vegetable market. In a sense, although the distances are not large, the relocation of fishing facilities to the edge of town has partly marginalized fishing compared to former times.

6.4 Lobster marketing practices

Lobsters caught by trammel nets may be taken to holding pens in shallow water for accumulation or landed immediately in Sauteurs. The latter usually occurs after morning slack, often around noon. Divers typically come in earlier, around 10-11 a.m. At Sauteurs there are no middlemen or vendors for lobster sales. Bypassing the market avoids a landing tax of EC\$0.05 per lb. Lobster landings are usually taken by road to the Grenville fish market for sale, and some also find their way to the capital, St. George's. Because of this marketing pattern, the landings are often not weighed at Sauteurs by the market manager who functions as data collector (unless the fisherman wants to know the weight), but are weighed in Grenville. The weights are not always communicated back to the Sauteurs market manager. It is likely that the data system deficiencies result in less lobster being recorded than is landed, especially at Sauteurs, but the amount of error is unknown. The markets accept lobster caught by the illegal fishing gear.

At the Grenville market most of the middlemen are male, assisted by a male and female workforce, and they sell a variety of seafood. Lobsters are sold locally mainly to hotels who get them delivered, and some goes to the state-operated Grenada Commercial Fisheries Ltd. Lobster is bought from the fishers at EC\$8.00 - 9.00 to re-sell at EC\$9.00 - \$10.00 wholesale. There is a flow through Grenville of about 150lb of lobsters per day from all sources. Sauteurs can supply 50 - 100lb a day. For past 2 years most of the supply was from trammel nets, but is

now mainly from divers. Supplies also used to come from traps, but this has declined substantially. Obtaining good statistics is often a challenge (Mahon and Rosenberg 1988).

6.5 Earnings from lobster

Although the Sauteurs fishers exploit several fisheries, lobsters and hinds are their mainstay. Lobsters reportedly provide over 60% of an average trammel net fisher's annual income. The lobster fishery provides them with their fishing identity and livelihood. Possible earnings from the fishery are estimated in Table 6.1 based on group interviews with fishers and fisheries officers.

These are rough estimates and do not take the various other types of fishing into account. Also not included is the value-added of the fishery in terms of export and retail consumer prices for lobster. However, the table gives guidance on potential earnings.

Table 6.1 Estimated earnings in the Sauteurs trammel net lobster fishery

| Statistic | Scenario A (low) | Scenario B (high) |
|-----------------------------------|------------------|-------------------|
| Total number of boats | 6 | 10 |
| Total number of nets | 12 | 25 |
| Cost per net | \$1,000.00 | \$1,000.00 |
| Total cost of nets | \$12,000.00 | \$25,000.00 |
| Number of fishermen/boat | 2 | 3 |
| Lobster landings per week (lb) | 60 | 120 |
| Ex-vessel lobster price (\$/lb) | \$7.00 | \$10.00 |
| Gross weekly income/boat | \$420.00 | \$1,200.00 |
| Gross weekly income/fisher | \$210.00 | \$400.00 |
| Weekly operating expenses/boat | \$300.00 | \$400.00 |
| Net weekly income/boat | \$120.00 | \$800.00 |
| Net weekly income/fisher | \$60.00 | \$266.67 |
| Average fishing weeks per month | 2 | 3 |
| Length of lobster season (wk) | 16 | 24 |
| Gross seasonal income/boat | \$6,720.00 | \$28,800.00 |
| Gross seasonal income/fisher | \$3,360.00 | \$9,600.00 |
| Seasonal operating expenses/boat | \$4,800.00 | \$9,600.00 |
| Net seasonal income/boat | \$1,920.00 | \$19,200.00 |
| Net seasonal income/fisher | \$960.00 | \$6,400.00 |
| Gross ex-vessel value of fishery | \$40,320.00 | \$288,000.00 |
| Net ex-vessel value of fishery | \$11,520.00 | \$192,000.00 |
| Gross value minus total gear cost | \$28,320.00 | \$263,000.00 |
| Net value minus total gear cost | -\$480.00 | \$238,000.00 |

Only EC\$ are used

For the lobster fishery to continue to attract fishers in preference to other fisheries it is likely that the earnings are on the high side of these estimates. Estimated earnings from the fishery can be compared to those from likely alternative livelihoods in order to determine the most profitable livelihood options available to fishers. Net fishers report making at least \$200 a week or about \$5,000 gross per lobster season.

The figures may also serve as a decision-making guide by government for estimating what expenditure on management and the fishers may be considered appropriate in relation to the value of the fishery. Taking a net fishery value of \$200,000 per season, a guideline of 10% of the fishery value being allocated to a management budget would mean that \$20,000 could be spent overall, including regular salaries, additional time, goods and services provided as management inputs. If there is collaboration by the fishers in fishery management then their costs must also be included. There is no universal rule for determining how much should be spent on fishery management, but knowing the value of the fishery assists in making such decisions. Additional factors have to be considered when broadening the analysis to integrated coastal management.

6.6 Poverty

6.6.1 Poverty assessment

Poverty is the inability to maintain a minimal standard of living. The Statistical Office in conjunction with the Ministry of Finance and Planning, the Caribbean Development Bank and Kairi Consultants of Trinidad conducted a Survey of Living Conditions (Household Poverty Survey) and a Community Based Poverty Assessment Survey during the first half of 1998. The Poverty Assessment Report on Grenada (Kairi Consultants 1999) provides an examination of the economic and social conditions of the population of the country. This is the most recent comprehensive assessment. Extracts from the report are summarized in this chapter.

Kairi Consultants' analysis of the national survey data revealed that 32.1% of all individuals in Grenada were poor in that their annual expenditure was less than EC\$3,262. This is the cost of meeting their minimal food and other basic requirements. About 12.9% of all individuals in the country were found to be extremely poor or indigent. Poverty was found to affect particularly the youth, with over 56% of the poor being less than 25 years old. Limited education, high unemployment, and poor social amenities (garbage disposal and safe sources of potable water) in some areas, were acute problems. Poverty has been exacerbated by the decline in the agricultural sector and remittances. During the 1960s to 1990s, family remittances from North America and United Kingdom provided significant support for the rural poor. As strong bonds between families and extended families disappear, reduced remittances lead to increased poverty (Peters 2000).

6.6.2 Geography, gender and education

Grenada is divided into parishes, and poverty has generally been assessed at the parish level (Kairi Consultants 1999). The poor are fairly evenly spread throughout the country. St. John's, however, had a much lower percentage of poor (23.9%) compared to a national average of 32.1%. The severity of poverty was greatest in St. David's followed by St. George's. The poverty gap was also greatest for St. George's, that is to say, more resources would be needed to bring the poor in St. George's up to the poverty line than anywhere else. The poverty gap was lowest for St. John's. St. Patrick's, the parish of the case study, contains about 10% of the population. The parish is mainly agricultural and less prosperous than others, with a high percentage of the population being assessed as poor (Table 6.2).

Table 6.2 Socio-economic distribution of poverty by parish

| Parish | As a % of non-poor population | As a % of poor population | % of parish population poor | Total parish population (no.) | Parish and percent of sample |
|---------------|-------------------------------|---------------------------|-----------------------------|-------------------------------|------------------------------|
| St. George's | 28.6 | 31.7 | 34.4 | 1202 | 29.6 |
| St. John's | 15.0 | 10.0 | 23.9 | 543 | 13.4 |
| St. Mark's | 4.5 | 4.8 | 33.5 | 188 | 4.6 |
| St. Patrick's | 12.0 | 14.0 | 35.4 | 514 | 12.6 |
| St. Andrew's | 25.6 | 26.6 | 32.9 | 1052 | 25.9 |
| St. David's | 10.2 | 9.8 | 31.3 | 409 | 10.1 |
| Carriacou | 4.1 | 3.1 | 26.8 | 153 | 3.8 |
| Total | % | 100 | 100 | 4061 | 100.0 |
| | No. | 2758 | 1303 | | |

(Source: Kairi Consultants 1999)

There was no evidence of gender differences. The poor are evenly divided between males and females. Among the poor, stated female headship was greater than stated male headship, but not significantly so. It was 52% as against 48% for men. St. Patrick's has a moderate proportion of female-headed poor households (Table 6.3).

Table 6.3 Distribution of poor female-headed households by parish

| Parish | % poor female-headed households | |
|---------------|---------------------------------|-------|
| St. George's | 33.3 | |
| St. John's | 9.4 | |
| St. Mark's | 3.6 | |
| St. Patrick's | 13.8 | |
| St. Andrew's | 28.3 | |
| St. David's | 8.0 | |
| Carriacou | 3.6 | |
| Total | % | 100.0 |
| | No. | 138 |

(Source: Kairi Consultants 1999)

As much as 64% of the population had no form of educational certification. The country as a whole was assessed as having a limited human capital stock as represented by the level of education attained by the mass of the population. The 1998 labour force survey measures male unemployment in St. Patrick's as 18.7%, well above the national average of 10.5% for males (Hunte 2000).

6.6.3 Factors contributing to poverty

There are many factors responsible for poverty in Grenada. The most important is the untransformed nature of the Grenadian economy since Grenada's industry has not fully exploited opportunities for internal linkages: e.g. tourism is not well linked to agriculture (Kairi Consultants 1999). The informal sector and small and medium sized enterprises are incapable of providing protective employment for the population and lack the capacity to transform the economy. This fundamental weakness is exacerbated by a host of other factors:

- Difficulties in the macro policy framework and in the incapacity of key agencies of state to create and support dynamic transformation;
- Limited safety net to protect the poor and those at risk;
- Limitations in the physical infrastructure;
- Poor community organisation and the inability of the people in their communities to exploit their internal resources for transformation; and
- Limited coordination and cooperation among Government agencies, NGOs, and CBOs.
- Gaps in the institutional infrastructure;

6.6.4 Gaps in the institutional infrastructure

Institutional gaps are of particular interest to this study. Kairi Consultants (1999) note that institutional underdevelopment results in absence or delay in addressing social and economic problems. They identify several maintaining factors:

- Problems of coordination among state agencies reduce the effectiveness of government and contribute to inefficiencies in the use of human and financial resources;
- Failure at the local level to generate organisational structures results in poor mobilization of local effort;
- Poor coordination between NGOs and government agencies result in duplication of effort in some areas and absence of initiatives in others, to the detriment of the society;
- Some communities are over-researched and are now the “popular poor”;
- Absence of Local Government structures reduces the probability of local initiative to address collective issues.

Kairi Consultants (1999) also conducted detailed community assessments. In communities assessed in detail, informants identified several key factors that, in their view, contributed to, perpetuated and kept them in a state of poverty. Chief among these were unemployment, lack of job opportunities, unavailability of regular work, and low skills of the majority of community members, especially in communities where the majority of people depended on agriculture and in which agriculture has declined. Other related factors include poor attitudes, identified by several people as being manifested in indifference, laziness and unwillingness to do whatever work is available. Political negligence was seen as an important contributor to poverty, as is the very low level of education of large numbers of people in these communities. This includes deficient literacy and technical skills. Linked to this and mentioned by several is low self-esteem, lack of self confidence, little motivation and high levels of dependency displayed by many. Lack of resources including the loss of valuable human resources that has resulted from internal and overseas migration, lack of access and/or limited access to land, and limited credit facilities, as well as abuse and underutilisation of natural resources were also cited as contributing factors. Other factors identified were crime and drugs and absence of organised community groups. It is interesting to note that many people in all of the communities also saw drugs and crime as forms of employment, as income sources and as alternatives to living in poverty.

6.6.5 Economic diversification

Programmes of economic diversification have led to a change in the economic structure of the country with new areas of production such as manufacturing and services beginning to play a more prominent role in employment and output. Concern has been raised about the distribution of the GDP among the population (Ministry of Finance, Planning and Development 2001). Poverty levels still remain high. Measures are to be put in place to improve living conditions of the poor. In its medium term strategy the government recognises that investment in human and social capital can contribute significantly to raising living standards (Ministry of Finance,

Planning and Development 2002). More emphasis is to be placed on the social sectors, in particular education and health, not only in an attempt to arrest and eradicate poverty, but also to create a foundation for sustainable growth and development.

6.6.6 Farming and poverty

There are no poverty studies specifically on any fishing communities but, since farming and fishing are sometimes closely linked, lessons from farming may be relevant. For example there are trends of decreasing employment of male youth in farming that could result in increasing entry into fisheries, especially in an agricultural parish such as St. Patrick's (Box 6.2).

Box 6.2 Youth trends in farming and poverty

An IFAD mission to Grenada in 2000 found that one of difficult issues the country faces, is that of attracting male and female youth to farming. Grenada is unusual in that around 87% of farming is an individual rather than a household activity. Unlike in many other island economies, there are few squatters; farmers tend to own their own land. Both men and women are involved in agriculture, but most do so on a part-time basis. The typical farmer in Grenada tends to be an older female cultivating a small plot of land for subsistence purposes. The disinterest of youth in farming poses a threat to agriculture and aggravates urban unemployment and social problems

The size and age of the farming population poses a long-term threat to productivity. Farmers are decreasing in number. Farmers in Grenada tend to be older than those in many other countries. Clearly the young labour force is not entering agriculture. This in spite of the high unemployment rate (15%) in Grenada and the lack of alternative opportunities for entry-level youth with minimal education. Many young Grenadians are simply not interested in taking over the family farm. This is the result in part of the problems agriculture faces and its lack of profitability. There is a rural-urban drift and out-migration, as both male and female youth are attracted by other values and life styles, especially American ones. Those youth who do remain are largely uninterested in joining community organizations or taking part in community activities.

This situation is not unique to Grenada. To some degree, it exists in many countries. But in Grenada it has serious implications for agriculture and for the nation. One result is poverty, especially poverty among the young. Statistics reveal that a total of 51% of Grenadians who live below the poverty line are under age 20.

Source: IFAD 2000.

6.7 Cultural events

Celebrations of St. Patrick's Day (March), Fisherman's Birthday (June) and the Sailing Club Regatta (October) are some of the main social and cultural events. Fisherman's Birthday on 29 June is a big event in recognition of fishing everywhere in Grenada. It involves blessing of boats, boat parades and pageants, fun and festivities. Although not as big as in Gouyave (see seine case study), it is important to Sauteurs. Events are organised by the St. Patrick's Fisherman's Cooperative with assistance from the St. Patrick's Organisation for Development (SPOD) (both described later). Lobster does not feature highly in any of these cultural events. Relatively few local organisations and institutional arrangements are relevant to the lobster fishery at present, but several have potential to be change agents in favour of co-management.

7 Community-level institutional and organisational arrangements

This and the following section examine institutional arrangements at different scales of analysis (Figure 7.1). The scales expand outward and are nested to show their linkages and inter-dependence. Scales beyond the community level are considered to be external.

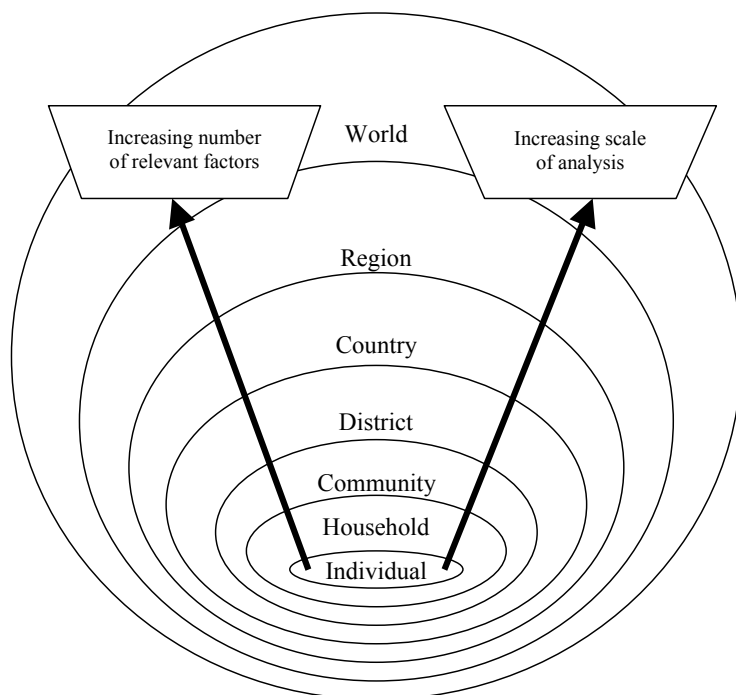


Figure 7.1 Number of factors to be addressed increases with scale of institutional analysis

Institutions are the customary rules and modes of interactions that people develop in order to effectively carry out their functions. Factors of interest to an institutional assessment include those in Figure 7.2. They are relevant to how co-management functions, is sustained, or fails.

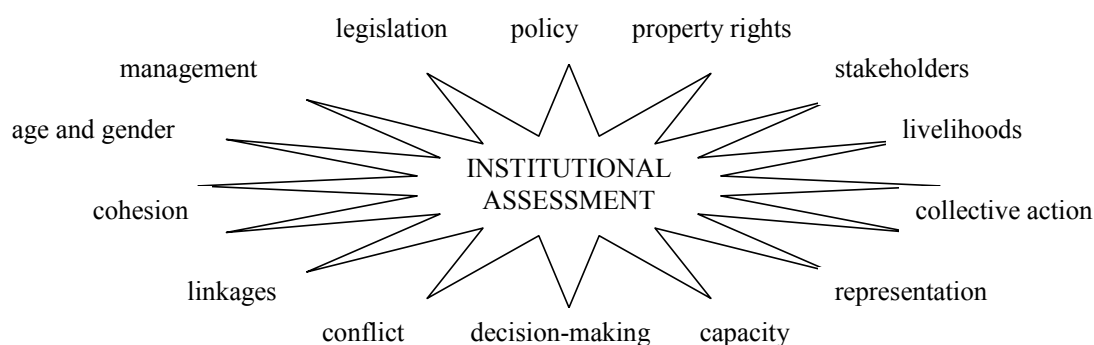


Figure 7.2 Some of the factors to be considered in institutional assessment

7.1 Ministry of Agriculture, Lands, Forestry and Fisheries

Kairi Consultants (1999) view the ministry responsible for agriculture and fisheries as a key agency of government in combating poverty. They describe it as strong in the analysis of

problems, but not as effective in bringing remedies to problems, revealing anticipation of the possible rather than execution of effective developmental measures. The ministry needs to help fishermen to see themselves in a larger regional context, and “the equivalent of rural sociology is required in working with fisherfolk and the Ministry has to gear itself in that regard” (Kairi Consultants 1999). Although the Fisheries Division is present in Sauteurs, the Ministry itself is external to the sphere of operation of the fishery and its management. However, it has a very important role to play given the considerable extent of policy decision-making in this case.

The ministry’s mission, to “facilitate agricultural development through promotion of sustainable use of natural resources and the provision of quality products and services to enhance the quality of life of our people”, guides its roles and functions below (Finlay and Franklin 2002).

- Provide leadership and policy direction to the sectors
- Ensure sustainable use of natural resources
- Create the enabling environment for optimal agricultural production and investment
- Foster the use of appropriate technologies and information
- Provide quality services and products to all stakeholders.

The ministry delivers its services through a number of departments, divisions and statutory bodies, including the Fisheries Division and Grenada Commercial Fisheries Ltd. The latter is not particularly relevant to this case.

Government sources (Ministry of Finance, Planning and Development 2001 and 2002) suggest that agriculture sector growth is constrained by:

- Weak institutional framework and inadequate support services
- Small domestic and regional markets
- Inadequate and inappropriate information to support and planning and policy decisions
- Reduced incentives in the sector
- Weak infrastructure in particular roads, irrigation, marketing facilities for non-traditional crops
- Inadequacy of air transportation in terms of cost, and handling facilities
- Weak linkages with other sectors of the economy

7.2 Fisheries Division of the Ministry of Agriculture

The Fisheries Division is governed by the Grenada Fisheries Act and Regulations (Cap. 108). Finlay and Franklin (2002) note that its roles and functions include:

- Monitoring, control and surveillance (MCS) of fishing activities in order to sustain fish stocks and habitat, collaborating with States sharing fisheries resources.
- Establishing and maintaining infrastructure in support of fishing activities.
- Maintaining a fisheries management programme in collaboration with local fishing communities.

Delivery systems include coordination and management, extension service, fisheries biology, fishing technology, aquaculture, marine protected areas, socio-economic monitoring, fisheries project planning and implementation. Functional links are maintained with the Coast Guard for fleet safety, search and rescue, and enforcement of fisheries regulations. Other allied external agencies include the Port Authority, Board of Tourism. Internally, the Forestry Division and Planning Unit of the ministry are very relevant.

The staff of the Division is small (Figure 7.3) and, despite an excellent extension service, the Sauteurs fishery is far removed from the immediate influence of the fisheries authority. This is

mitigated to some extent by the coincidence that the acting Chief Fisheries Officer, who is a former fisher, still lives in Sauteurs and has intimate knowledge of the fishers and fishery.

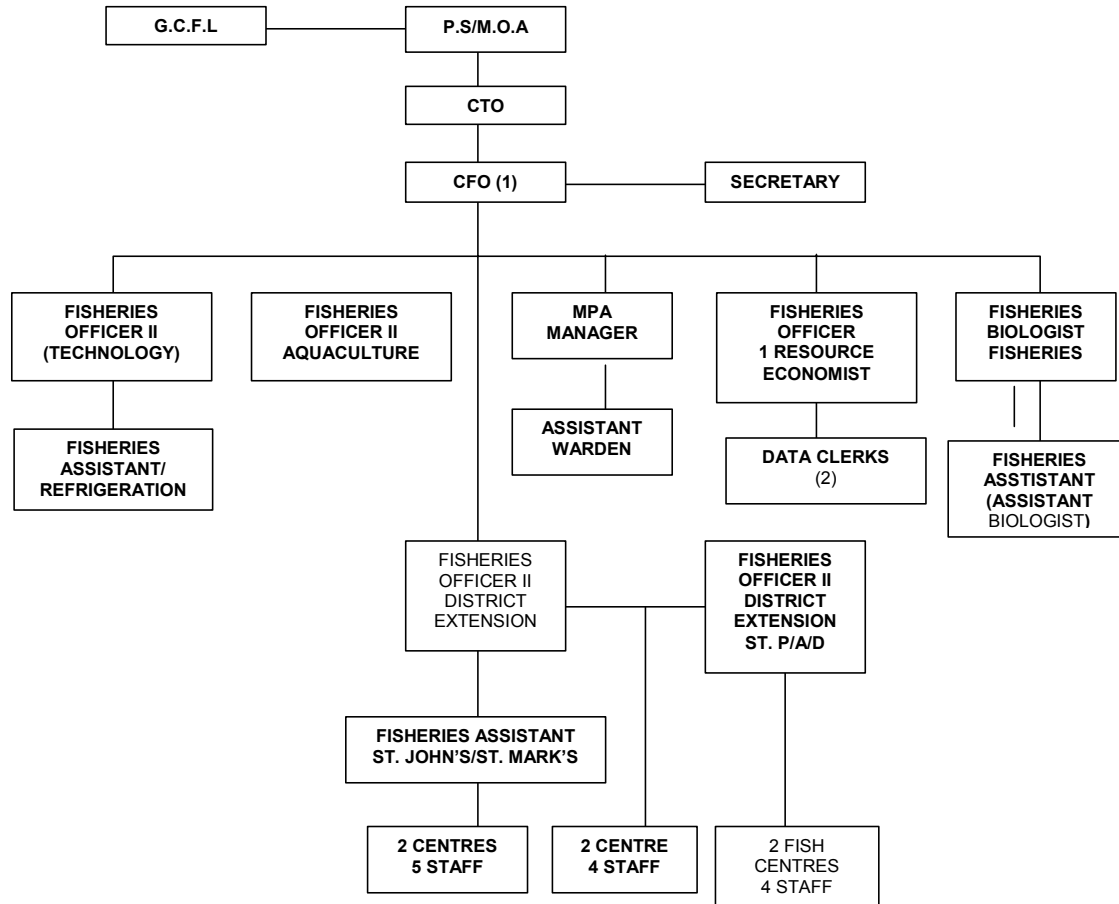


Figure 7.3 Fisheries Division structure and staffing

7.3 St. Patrick's Fishermen's Cooperative

According to the records of the Cooperatives Division, it was first called St. Patrick's Fishing Cooperative Society Ltd. and was registered on 27 March 1981. Membership was open to persons engaged in full-time fishing, residing in St. Patrick's and over 17 years in age. The Cooperatives Division suggested the need to fishers and initiated formation of the organisation.

This was during the rule of the People's Revolutionary Government (1979-1983) when there was strong support for cooperatives and community mobilisation in general. The PRG also established a National Cooperative Development Agency (NACDA), which encouraged unemployed youth to set up agricultural cooperatives by supplying them with loans, access to land and training in farming, bookkeeping and marketing (Kairi Consultants 1999). Upon formation of the cooperative NACDA funded a fish marketing and processing project through a EC\$67,000 loan for building and cold rooms. NACDA also assisted the fledgling cooperative with administration and facilitated the set up of banking with Grenada Cooperative Bank in 1982.

In May 1982 there were 40 fishers in the cooperative. The co-op purchased fish from member and non-member fishers and sold it wholesale on credit to National Fisheries, a government-run fish-marketing agency. Also in 1982, fishers became upset at having dump fish due to poor marketing and facilities, they complained of the high electricity bill of the co-op facilities, and that St. George's Hospital was not buying their contracted quantities of fish.

In the first quarter of 1983 NACDA reported a decline to 24 cooperative members and problems of poor management and record keeping. Apart from the infrastructure funding, the co-op was undercapitalised through reliance mainly upon membership dues. Additional escalating concerns included the large debt owed by National Fisheries, difficulty servicing the bank overdraft due to high operational costs (salaries, debt and utilities), lack of marketing facilities and inadequate training. Cash flow, leadership and member loyalty could not be maintained. In 1983 a decision was taken to market mainly ocean fish (large pelagics) that were in higher demand, but in June 1983 marketing operations apparently ceased. Lobsters were sold to private buyers, not National Fisheries, but this provides background to the organisation of fishing at the time.

Remaining members tried to re-organise the cooperative in the late 1980s. They requested funds for gear storage and a tackle shop. They received capital funds from government's Community Development Department through a British Development Division grant to build on land provided by government at the western end of town. Problems with the structure of the building, and the death of one of the co-op leaders, caused setbacks to the revival initiative that is only now beginning to pick up pace again.

The president of the cooperative, who is an important figure in the lobster case study as leader of the fishermen's group, is attempting to get clear title to the land that the cooperative building stands on next to the fish market, and to acquire grant funds for completing the structure. Part of the building is used free of charge by fishers as a storage area. The cooperative has a bank account, but no properly functioning committees or management structure. At present the president tends to make most of the decisions on reviving the cooperative in consultation with a few close fishing associates. During the study period the fishers made several attempts to hold meetings on site with the Cooperatives Division, but all had to be cancelled for various reasons. However, the Cooperatives Department maintains that revival of this cooperative is high on their agenda for action.

7.4 Cooperatives Division

The Cooperatives Division of the Ministry of Housing, Social Services and Cooperatives is responsible for the registration and oversight of producer cooperatives and credit unions under the Cooperatives Act. There is little communication, and no collaboration, between this agency and the Fisheries Division on the management and development of fisheries cooperatives. They work separately. The Cooperatives Division is currently trying to revive or strengthen fisheries cooperatives, several of which have become dormant. The Soubisse Fishermen's Cooperative is said to be functioning adequately, and St. Patrick's is about to receive their attention as noted earlier. If this Division is instrumental in assisting with the revival and completion of the building, then it could become a more significant player in the organisational aspects of fishing in Sauteurs. The Division has no direct role in the management of fisheries at this time, but is a critical component in the attempt to organise the fishers and establish co-management.

7.5 St. Patrick's Organisation for Development

Most of the parishes have quasi-NGO organisations that assist in coordinating small community groups, promoting cultural events in the parish and generally being of assistance at grassroots level. The term “quasi-NGO” is used because the parish organisations tend to have strong political party ties in terms of funding, leadership and other features.

The St. Patrick's Organisation for Development (SPOD), formed seventeen years ago, was originally labelled the St. Patrick's Tourism Development Committee with an emphasis on promoting the tourism potential of the parish, utilising its natural beauty, culture, art and crafts. The parish is showcased around 17 March, St. Patrick's Day by community events. The 16th annual St. Patrick's Fiesta was held in 2002. SPOD plays roles of facilitator, promoter or organiser as needed depending on community capabilities. Some events serve as fund-raisers for SPOD, and the organisation is looking to set up a permanently staffed office. It was reported that Sauteurs has a lower and more low-keyed level of community participation than Gouyave (the other Grenada case study site).

SPOD's theme for the year 2002 was “building confidence through community participation”. Literature on this aspect of community development was distributed along the lines of empowering the parish settlements (about 12) to contribute more to the economy by more confidently diversifying their various outputs through collective action. SPOD holds monthly meetings of its executive and members that are open to the public. The public can vote on some decisions. These meetings are typically held in Sauteurs and people from other areas are said not to attend many, giving the impression to some that SPOD is primarily a Sauteurs organisation. Political party interference and personal political agendas were said to complicate the working of SPOD.

SPOD has limited interaction with fishing or marine matters except for assisting the Fisherman's Day celebrations and helping to revive the Sauteurs Bay regatta. A fisherman was among their 2002 community recognition awards. SPOD members interviewed had no direct dealings with the lobster fishery or Levera golf tourism project, but expected the latter (from what they heard) to have a positive impact on the parish, and particularly its economy. SPOD is the most comprehensive parish organisation in its geographic coverage and portfolio. Its potential to become involved in lobster co-management may depend on the extent to which co-management is integrated into government policy.

7.6 Community organisation from a poverty perspective

The higher the level of community organisation, and the more cohesive and integrated is a community, the greater is the probability that it should be able to identify and implement solutions to its own problems by mobilising internal, and leveraging external, capabilities and resources including public goods and services available from the State.

Kairi Consultants (1999) found that in many poor Grenadian communities there is weak organisation. Communities recognised that they are poorer for the absence of such capacity. On the other hand, communities which may yet be materially poor, but which can mobilise for collective action, are likely to provide more of the required solutions to their problems, irrespective of external resource flows. Indeed, in the absence of internal organisation, inflows are likely to be frittered away. There is a tradition of the “maroon”, based on social capital, which may have to be nurtured in communities where it is weak or no longer exists.

These findings have implications for policy. The ministry responsible for Community Development has made some impact on some of the poorer communities (Kairi Consultants 1999). Yet there are communities that are unable to mobilise resources to address their own problems. In some situations, the ministry has no contact with these communities and the existing NGOs may not have a presence either. Thus, while some communities may be able to undertake development tasks on their own, there is need for an early-warning system that establishes which communities lack capacity for self-mobilisation and which, at a particular point in time, may not have attracted the attention of NGOs or have community-based organisations (CBOs) of their own. However, there are communities that attract a disproportionate amount of attention and resources. These have become development effort favourites. Kairi recommends that the Ministry of Community Development may need to utilise GIS mapping in reviewing interventions in communities by the Ministry itself, and by NGOs, to better deploy resources where they are most needed.

8 External institutional and organisational arrangements

Moving beyond the organisations that are prominent in Sauteurs and the lobster fishery, there are several external institutions and organisations that impact on the fishery.

8.1 Community Development Division

The Community Development Division is in the Ministry of Youth, Sports, and Community Development. It has helped most communities in Grenada to address their needs for water, roads, community centres, hard courts and day-care centres through initiatives for personal and community development, but some feel that emphasis is placed on physical, infrastructural development rather than on human resource, people-centred development (Kairi Consultants 1999). In Sauteurs the Community Development Division assisted the St. Patrick's Fishermen's Cooperative to construct their building through a grant from the British Development Division in the early 1990s when there were about 12-15 active cooperative members. Reports on the project identify internal conflict, poor management and lack of leadership as problems experienced.

Community Development officers have had little interaction with fishing in St. Patrick's since then except to observe the organisation of annual Fisherman's Birthday celebrations. They describe St. Patrick's as having very active, but low-keyed, participation in small communities. The agency has had no interaction with the Levera golf tourism project, nor is it aware of social impact studies on the surrounding communities, some of which are described as depressed. Like SPOD, the Community Development Division has a potential role based on its mandate rather than current practice.

8.2 Credit organisations

St. Patrick's Cooperative Credit Union Ltd., established since 1959, annually provides a few small loans for boat engines and fishing gear, as does the Grenada Cooperative Bank. The National Commercial Bank (NCB) does not usually lend to fishing as it is deemed too risky.

Alternatives to commercial finance, especially for small amounts, lie in community rotating credit institutions such as "susus". In some communities both the concept and practice of self-help are very much alive and evident in the existence of the "maroon" through which people share their time, talents and labour to help one another with house repairs, planting and reaping of crops. It is possible that credit organisations could play a larger role in the lobster fishery if the alternative

fishing gear to the trammel nets requires greater investment in gear or boats than at present, or if there is no governmental finance for the initial adoption of new technology.

8.3 Non-governmental and community-based organisations

In their poverty assessment, Kairi Consultants (1999) paid considerable attention to non-governmental organisations (NGOs) and community-based organisations (CBOs) in the context of pro-poor strategies. The sections below are based mainly on their findings.

Ideally, community organisations allow members to mobilize and arrange themselves to make the best use of available resources to meet community needs and collectively solve problems. Grenada has a considerable number of NGOs and CBOs, along with governmental agencies engaged in promoting development and providing support for the poor and their communities. There has been some coordination amongst the developmental NGOs, but there is little coordination among NGOs and government agencies in addressing the problems of the poor.

As elsewhere in the Caribbean, NGOs and CBOs are often regarded as the base for opposition political movements and tend to be held in some suspicion by ruling parties. Because of this, governments have often resorted to establishing development agencies, which are designed to appear as NGOs. Most of the NGOs derive their resources from external sources. This too, tends to create suspicion in governments since these organisations, if deemed hostile to a government, cannot easily be thwarted by lack of state support. On the other hand, the relatively greater attention paid to lower income and food deficit countries elsewhere has reduced the flow of resources to NGOs in Grenada and other Caribbean countries with the result that they have to depend more on local funding, including subventions from government.

It is possible to identify two types of NGOs whose activities contribute to the development of the agriculture sector that includes fishing. First there are collective organisations that producers have established themselves and which are expected to help meet the needs of their membership. Second there are developmental organisations that direct resources, financial assistance, technical assistance and advocacy in the service of smaller operators in the agricultural and fishing sectors. The first category includes the St. Patrick's and Soubisse Fishermen's Cooperatives. In the second category, the Agency for Rural Transformation (ART) and Grenada Community Development Agency (GRENCODA) have assisted fisheries. The latter NGOs have assisted others to address their problems, identify solutions and collaborate, including engaging in negotiations and advocacy with the public and private sectors.

Grenada's community organisations are at various stages of development and vibrancy. Interest and participation vary widely, and are determined by leadership, the type of programmes and activities being offered, and whether these are meeting individual and community needs. People recognise the need for organized groups within a community, and in most there are church groups, community development groups, sports clubs and youth groups. In several community groups, the levels of interest and participation in their activities are very low and the same few people are always involved. Reasons given for this included lack of interest, indifference and lack of motivation. Other reasons might be that the activities and programmes being offered are not relevant and, therefore, not meeting people's needs. Low levels of organisation skills may also be a factor.

8.4 Informal sector support

The informal sector includes most small-scale fishing. Many persons earn their livelihoods within the informal sector, but what little support exists for it derives mainly from the NGO community.

The poor are generally starved of organisations that can help them to develop themselves, but the interventions and work of two development NGOs (ART and GRENCODA) were mentioned over and over again by poor people in these communities (Kairi Consultants 1999). These organisations have provided assistance to individuals and families to enable them to meet their basic needs. They have implemented community education and training programmes to help community members acquire and upgrade skills, and they have organized community projects to provide goods and services to communities. This includes some in fishing, but not much in St. Patrick's.

8.5 Environmental legislation

According to the National Biodiversity Strategy and Action Plan (NBSAP), there are about 40 Acts that together govern protection and management of Grenada's forests, soil and water conservation, planning, development and use of lands; provide for control of beach protection, management of fisheries, protection of marine reserves; protection of wildlife and habitats; control of pesticides, pollution and waste management. Enforcement of many is either poor or non-existent, either through lack of awareness of the particular legislation, lack of support for enforcement, unclear jurisdiction where there is overlap with several agencies and absence of accompanying regulations to respective Acts. Some pieces of legislation are inadequate and require revision. A need for better inter-agency collaboration was also considered essential for conservation of both terrestrial and marine resources.

8.6 Lobster fishery regulations

Unselective gear is not favoured under the international Code of Conduct for Responsible Fisheries. Because trammel nets are widely reported to be unselective but very efficient, their use has been prohibited or severely restricted in many countries of the Caribbean and around the world for any type of fishery. According to Grenada's current draft fisheries management plan for lobster, the fishery is nationally fully or over-exploited (Appendix 2). The plan also complains of unspecified habitat degradation. Conservation measures are necessary in the spiny lobster fishery. The term "conservation" is usually taken to mean fishery management for sustainable utilisation, not purely preservation.

The Grenada fisheries legislation makes provision for the conservation of lobsters and other marine species. The Fisheries Regulations, since SRO # 9 of 1987, stated in Part VI Section 16 (3) that "No person shall capture lobster other than by hand, loop, pot or traps". Any person using a net for lobster was in contravention of the law. The Fisheries (Amendment) Regulations, SRO # 2 of 2001, Section 7, new regulation 22 (B) (1) states that " No person shall use a trammel net in the in the fisheries waters of Grenada". It explains: " For the purpose of this regulation "trammel net," means a net consisting of three panels of varying mesh sizes". As of January 7th 2001, the trammel net was banned in the fishery waters of Grenada for all fisheries, and this should have been known and enforced. The full suite of regulations is in Box 8.1 below.

Box 8.1 Regulations relevant to the lobster fishery

These are compiled from various regulations and their amendments

1. "Undersized" lobster means
 - (a) less than 250 mm (9.8 inches) in length when laid flat and measured immediately from behind the rostral horns and to the near edge of the telsonor

- a carapace length of less than 95 mm (3.7 inches) measured from immediately behind the rostral horns to the maximum concavity of the near edge of the carapace
 - (b) less than 680 grams (1.5 pounds) in weight
 - (c) having a tail weighing less than 340 grams (12 ounces)
2. No person shall have in his possession sell or purchase
 - (a) any lobster carrying eggs, or
 - (b) any lobster which is undersize, or
 - (c) any lobster which is moulting
 3. No person shall capture any lobster other than by hand, loop, trap or pot
 4. No person shall use a trammel net or channel net in the fishery waters of Grenada. For the purpose of this regulation trammel net or channel net means a net consisting of three panels of varying mesh sizes
 5. No person shall spear, hook or otherwise impale a lobster in the fishery waters
 6. No person shall have in his possession or sell any lobster that has been speared, hooked or otherwise impaled.
 7. No person shall remove the eggs from a lobster, or have in his possession, sell or purchase a lobster from which the eggs have been removed.
 8. The Minister may by Notice published in the Gazette declare any period as a closed season for lobster. The closed season currently in effect is from 1 May to 31 August each year.
 9. No person shall fish for lobster during the closed season.
 10. No person shall land from a fishing vessel any lobster that is not whole.

Source: Project Inception Workshop

As the approach to fisheries management changes from regulation to more comprehensive planning the opportunity should be taken to assess the current regulations against criteria such as their effectiveness, enforceability, adequacy, cost versus benefits, compliance etc.

8.7 Fisheries management plan

Fisheries management planning is still new to the Caribbean. The draft fisheries management plan (FMP) for spiny lobster in Grenada originated with activities under the Food and Agriculture Organisation (Mahon 1990) and the sub-project on fisheries management planning of the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP). The generic template has been modified through local fishery consultations to produce a more Grenadian content (Appendix 2).

Similar planning has been undertaken in neighbouring countries (e.g. McConney and Mahon 1998; Fisheries Division 1997 and 2001). Employing participatory processes is consistent with the direction of sustainable natural resource management and planning (Chakalall et al 1998; Charles 2001). Participatory planning provides the basis for co-management and other forms of more inclusive (rather than command-and-control) resource management advocated for fisheries everywhere, but especially for small-scale fisheries (Berkes et al. 2001). It is appropriate to pay attention to the planning process before considering the lobster plan document into which the Sauteurs case should ultimately fit.

8.7.1 Planning process

The planning process is already underway and has to be completed. Although the fisheries authority could complete the draft plan and then seek the comments of the fishing industry in public meetings, it was advised to engage the industry more fully. The system should be

designed to provide legitimacy in both process and content. A form of participatory strategic planning (Figure 8.1) was recommended.

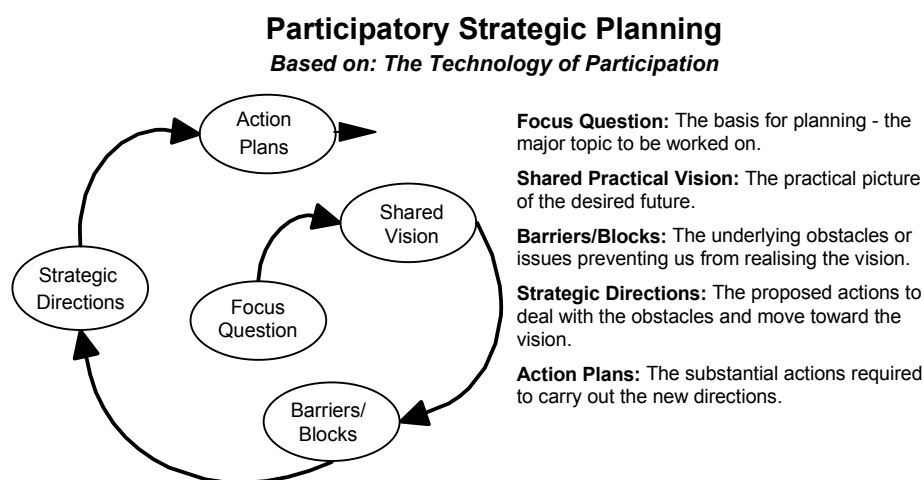


Figure 8.1 Participatory strategic planning process

Knowledgeable persons from the fishing industry could be selected, preferably nominated by industry participants, and asked to serve on a temporary panel for the formulation of the FMP. Once the panel has tackled the management plan, based largely on the technical and scientific information of researchers and the fisheries authority combined with the popular knowledge of the other stakeholders, the implementation plan may be addressed. These two plans can be reviewed together in the public consultations. Figure 8.2 summarises the sequence of activities.

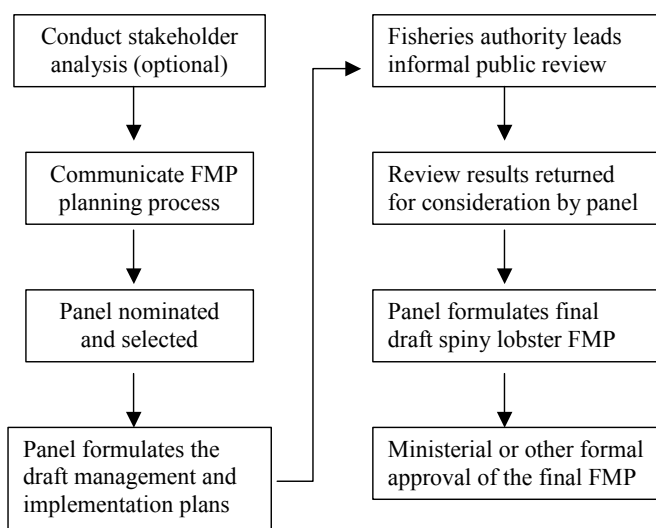


Figure 8.2 Summary of recommended planning process

Consideration should be given to how, and how often, the plan would be reviewed and updated in order to keep it current and useful for management. Lessons can also be learned from the participatory development of Grenada's forest policy (Bass 2000).

8.7.2 Lobster management implementation plan

In addition to the approaches in the current regulations the following should be considered:

- ◆ Closed areas (critical habitat)
- ◆ Fishing gear identification
- ◆ Trap limits and licensing
- ◆ Escape panels in traps
- ◆ Trap construction guidelines
- ◆ Authorisation of fishing vessels

One of the deficiencies noted during the co-management pilot project is that lobsters are not always recorded where they are landed, but are recorded where they are sold. The data will enter the fishery information stream mainly if sales occur at public markets. There is also need to document the prevailing marketing channels.

Because fisheries planning and management is new to Grenada, the opportunity should be taken to educate and communicate concepts. This may be done via participatory processes involving stakeholders (Box 8.2). In this way the plan may be seen as legitimate in both process and content, leading to higher levels of compliance. The levels of collaboration and other interactions experienced in the process may be used to gauge the appropriateness and form of co-management for this fishery.

Box 8.2 Community consultation extract from draft Fisheries Management Plan

Fishing community consultations and engagements between fisheries administration and fishers — 1980 to the present

Significant consultations and engagements between the Fisheries Division as Governance agency and fishers representatives and would have contributed to this strategic management and development process are summarized as follows:

10. Consultations with Sauteurs Ille De Ronde Fishers for Disusing the Trammel Net
 - ◆ A protracted process of consultations with fishers over a five (5) year period in order to assist fishers in adapting alternative gear and methods to replace the use of trammel nets.

Source: Fisheries Division 2002

8.8 Integrated coastal management

Grenada has no discrete coastal management unit. This responsibility is spread amongst agencies, but lies particularly with the Physical Development Department. Documents on coastal management often relate to the United Nations Framework Convention on Climate Change that Grenada ratified on August 1994.

9 Exogenous events

Exogenous events are those beyond the control of the resource users, fisheries authority and often the entire fisheries management system. They are more than uncertainty in the system, but include sudden shocks and surprises that test the resilience of both ecosystems and human

systems. Obvious examples are most types of natural disasters, but macroeconomic and social impacts are also very relevant to the small open economies of Caribbean countries.

9.1 Hurricanes

Grenada has limited low or flat land (1.9% of the total area, about 590 hectares, with less than 2% slope). This is concentrated along the coast. Most economic activities, communications, settlements and infrastructure are near the coast. All are vulnerable to sea level rise from possible permanent or temporary flooding. This vulnerability was highlighted during the extreme and unprecedented storm surges during the 1999 hurricane season. The vulnerability and adaptation analysis prepared by Peters (2000) provides much of the information below.

Grenada is on the southern path of the hurricane belt, but tropical storms have affected the country many times. Between 16 – 19 November 1999, category-four Hurricane Lenny packed winds reaching up to 200-220 miles per hour that produced surge flooding of 3 to 5m above normal tides, accompanied by large and dangerous waves. Intense rainfall and winds caused flash floods and mudslides. The damage to road infrastructure, private property and beaches was estimated at about EC\$700 million, or twice the annual budget of the country. Recovery from damage was estimated to take 5 - 10 years with external assistance.

9.2 Other vulnerabilities

There is also a tsunami threat from “Kick ‘em Jenny”, an active volcano about 150 m under the surface of the sea 7 km north of Grenada. Very recently another undersea volcano was discovered a few kilometres away. Earthquake is another hazard, and an active fault exists in the Levera area.

In 1999 a bacterial agent is believed to have caused a significant demersal reef fish kill, creating scarcity in the domestic supply of fish. During the fish kill, fisherfolk who fall into the lower socio-economic strata were unemployed for 3 to 4 months. The overall lost earnings of these people were suspected to be significant. The cost to government in the form of financial support or other remedial measures was not available.

10 Co-management incentives and patterns of interaction

The resource system and human system characteristics described in previous sections may provide incentives for the stakeholders to engage, or not to engage, in co-management. Incentives to cooperate, or not cooperate, vary with the stakeholders, particular circumstances, time and other factors. Co-management arrangements are often dynamic. Although incentives are very variable, they must always exist to make the effort of co-management worthwhile, otherwise it will not be sustainable. Finding new incentives to sustain co-management institutions can be a constant challenge for all partners.

Patterns of interaction reflect the nature of these positive and negative incentives and the types of partnerships that may be formed or sustained in co-management. Interactions between the fishers, Fisheries Division and parent Ministry are of most relevance.

10.1 Mixed messages and poor communication

Government files available for examination contained mainly official correspondence, and lacked notes on events that were happening or decisions being taken that did not result in memos or letters being written. Thus it was difficult to verify some claims about communication. In several instances related to the researchers by fishers and fisheries officials it seemed that

mixed messages and poor communication exacerbated the tendency of fishers not to comply with fisheries regulations that they did not agree with.

For example, contrary to the recollections of fisheries officers, fishers said that they did not request a 1995-96 suspension of enforcement of the net ban. They said they did not know of the ban. In the case of one net being seized for being used out of season, the net was later returned to the fisher and fishing resumed as usual.

From 1997-98 fishers were allegedly told to “hold up with the net until further notice” by the Chief Fisheries Officer. Fishers say they suspended use until the 1999 fish kill when, since inshore finfish were either not available or not easily marketed, they resumed using lobster trammel nets as their best means of income.

Fishers also reported interactions between themselves and policy makers or officials that made them uncertain of both the legal status of the nets, and the practical policy of the government regarding enforcement of regulated restrictions. The fishers claim to have received verbal approval from a policy-maker at the time to resume using the trammel nets after the fish kill.

Fishers also claimed that they experienced a prolonged period of uncertainty about whether nets were illegal since there was no public information programme on the new (2001) trammel net regulations. Fishers did not seek the readily available information on what was actually law, but discussed it amongst themselves. Fisheries officers maintain that the fishers were fully informed about all changes in legislation, even if they were not consulted on it prior to coming into force. Some fishers reported not completely trusting verbal or information from fisheries officers without corroboration by higher sources.

In almost all cases there were elements of both the fishers’ and authorities’ recollections that could be verified, but it appeared that none of the parties attempted to confirm that their communications were clearly understood. The other main issue is that neither the fishers collectively nor the fisheries officers shared information liberally. Therefore it was easy for persons on either side to claim ignorance if they had only been informed by rumour. Poor communication was a recurrent theme throughout this case.

10.2 Pilot project co-management agreement

Agreement was reached in a workshop on points that the fishers and Fisheries Division could use as the basis for co-management during the project period. These points are set out in Box 10.1, and representatives of both parties signed to them to indicate their acceptance.

Box 10.1 Points of agreement between the Fisheries Division and Sauteurs fishers

1. Fishermen know that harvesting lobster with trammel nets is, and has been, against the law
2. Fishermen are aware that they should find alternatives to illegal trammel nets
3. The Fisheries Division is expected to introduce alternative fishing gear and methods
4. All parties regret the delay to date in the introduction of alternative fishing gear
5. Fishermen are willing to participate in the demonstration of recommended alternative gear
6. Fishermen will abandon illegal trammel nets when viable alternative gear is demonstrated
7. The problems of the lobster fishery include non-compliance with several other regulations
8. Non-fishery potential or actual threats to the lobster fishery include habitat degradation
9. The government is aware of the need to have a comprehensive fisheries management plan
10. The fishermen and Fisheries Division will try out at least 3 new types of alternative gear

11. The gear will be acquired by the Fisheries Division and divided amongst the 10 boats
12. Gear trials will be undertaken collaboratively during the project and, if necessary, afterwards
13. Fishermen will contribute their labour and some ancillary materials towards the gear trials
14. The onus is on the Fisheries Division to get data from the fishermen on gear performance
15. The fishermen agreed to exercise honesty and integrity in the provision of information
16. Most Sauteurs fishermen cannot support their households on one type of fishing alone
17. The participants will consider initiatives for identifying viable alternative livelihoods
18. Participants agreed that project fieldwork shall conclude by 30 April (end of lobster season)
19. Parties are aware that work associated with this project must continue beyond its conclusion
20. Parties agree that this project and associated initiatives shall promote co-management

During the brief negotiations the fishers were initially adamant that the use of trammel nets was not illegal, even though earlier they had indicated awareness of all legislation governing lobster harvest. They also insisted that it was the role of the Fisheries Division to provide alternative “acceptable” fishing gear. To them, the main criterion of acceptability was a catch rate similar to that from trammel nets. There was little concern about preventing further damage to habitat. A video on the Code of Conduct for Responsible Fisheries was shown, and while the principles of responsible fisheries were appreciated, these clearly did not drive the fishers’ interest in co-management. Their primary interests were to obtain the most efficient alternative gear at least cost or to be allowed to continue using the nets with the consent of top policy-makers, even if objected to by the Fisheries Division.

10.3 Activities of the co-management pilot project

Achievements in the initial co-management pilot project and this guidelines project are set out against planned activities in Table 10.1 The pilot project was fairly successful, but the work was not complete. The government of Grenada and Sauteurs fishers continued activities as part of the Caribbean Coastal Co-management Guidelines Project case study.

Table 10.1 Activities of the co-management pilot project

| Work plan activity | Progress with implementation |
|---|--|
| Obtain information on lobster traps and pots suitable as alternatives | CaMMP supplied information, but the government fishing gear technologist and several fishers were knowledgeable about alternative gear. Internet access provided by the project proved useful to Grenada authorities. |
| Document lobster fishing in Sauteurs, area conditions and marketing | Information was collected to supplement an earlier fisheries report. The updated report includes regional context, fishing area, fishing methods, catch and by-catch, earnings from the fishery and conservation measures. |
| Determine the applicable lobster fishery plan and laws to communicate | The Grenada draft lobster fishery management plan was reviewed with the fishers and fisheries officers. CaMMP provided technical recommendations on the planning process and management measures for consideration. |
| Distribute copies of lobster management plans and fisheries regulations | The fisheries authority was not ready to distribute the draft lobster plan. A summary of lobster regulations was distributed at the inception workshop. All of the lobster fishers are aware of the regulations and their content. |

| Work plan activity | Progress with implementation |
|---|---|
| Provide information on responsible fishing practices (Code of Conduct) | Information on responsible fishing based on the FAO Code of Conduct for Responsible Fisheries was distributed at the inception workshop. Fishers appreciated the content, but promotion should continue for reinforcement. |
| Hold workshops and meetings on alternative lobster fishing gear and testing | The inception workshop and terminal meeting were the main events, and informal discussions have been ongoing. The main technical conclusions on fishing gear alternatives were quickly reached and agreed to by all parties. Examples of gear were examined and discussed in detail. |
| Reach co-management agreement for gear testing, evaluation and adoption | A 20-point co-management agreement was reached at the inception workshop and later signed by both parties. Fisheries authority gave its permission for fishers to use restricted fishing gear (new nets) in trials. |
| Obtain alternative gear and conduct test fishing with active sharing of results | Insufficient progress was made on this. Unforeseen difficulties and delays occurred in acquiring the test fishing gear. The remaining period of the lobster season was too short for trials to be properly conducted. Fishers did an unsupervised trial that failed in their perspective mainly due to damage. Follow-up is needed when the lobster season opens in September 2002. |
| Hold workshops and meetings to analyse and evaluate alternative gear | Meetings were held to consider options following the brief gear trial and it was agreed that new gear would be tried and jointly evaluated under supervision when the lobster season re-opens in September 2002. |
| Hold workshops and meetings to decide on adoption of alternative gear | No alternative gear has been finalised since trials are incomplete. The ban on trammel nets is to be enforced by government. This should motivate fishers to quickly seek alternative gear acceptable to the fisheries authority |
| Determine possible alternative livelihood opportunities for trammel net fishers | Few fishers have alternative livelihoods, but most switch between several alternative fisheries that employ them throughout the year. Promoting alternative livelihoods without adequately addressing the fishing gear problem would increase the tension between fishers and government. |
| Assist, as necessary, in reactivating a Sauteurs fishermen's organisation | Discussions were held with the Cooperatives Department. Workshops on leadership skills, and on conflict management and negotiation, trained about 40 fishing industry participants and fisheries officers, strengthened their collaboration and fostered information exchange for building capacity. |

The following sections highlight interactions that illustrate some challenges of co-management.

10.4 Government's decision to enforce the trammel net ban

Towards the end of the co-management pilot project, a month before the start of the 2002-2003 lobster season, the fisheries authority was asked by senior ministry officials to advise on the proposed lobster management. A ministry management meeting, to which no fishing industry representatives were invited, took a decision that the current fisheries regulations could not be violated to gather empirical evidence on either trammel or single panel nets. The senior officials decided that the only acceptable course of action would be to enforce the existing regulations

and find alternative fishing gear within the context of the net ban. The Chief Fisheries Officer instructed the gear technologist to make this announcement at the terminal meeting of the co-management pilot project (Box 10.2).

Box 10.2 Announcement of net ban enforcement

Fisheries authorities announced the government's decision to enforce the trammel net ban without providing an alternative fishing gear at the conclusion of the co-management pilot project terminal meeting on 15 August 2002 at Sauteurs. About 15 fishers and vendors, and 5 fisheries officers attended, although most of the latter were not in the room during the decision announcement.

Project progress and resulting management options were summarised. The latter were:

- Maintain — continue to ignore the fisheries regulations and allow trammel net fishing
- Accommodate — amend the fisheries regulations to legally permit trammel net fishing
- Enforce — uphold the fisheries regulations and actively prohibit trammel net fishing

The unilateral decision by government to adopt the latter option was met with an uproar from the fishers and vendors present. Two main points were raised in objection to the decision:

- ◆ The notice given for enforcing the law was too short, leaving them unprepared for the start of the lobster season (they expected use of the illegal gear to continue without hindrance).
- ◆ The Fisheries Division did not provide an alternative gear, acceptable to the fishermen, as agreed under the project in January 2002, and needed to live up to this responsibility first.

The fisheries officer announcing the decision provided drawings of alternative gear and showed a Canadian-style metal trap that a lobster fisher in another part of the island was experimenting with. Fishers examined and commented on these alternatives. Several were not averse to trying the gear if provided by government. However, they refused, as a group, to commit themselves to further action before avenues for reversing the decision at ministerial level were exhausted.

The fisheries officer making the announcement stressed that the delays in acquiring the nets and the lack of funds with which to buy the lobster pots were beyond the control of the Fisheries Division. He maintained that the co-management agreement was entered into in good faith, but circumstances required that the government take a decision that transcended the local situation and co-management agreement. Several fisheries officers conspicuously left the room during the exchanges that followed.

Several fishers voiced opinions that:

- The fisheries minister sympathises with fishers more than the fisheries authority
- Fisheries officers draw salaries and do not care whether they harm the livelihoods of fishers
- Government makes too many decisions without involving fishers, and this was not right
- To believe it, they needed to hear the decision from the minister, not fisheries officers
- Government must now be good to fishers since no help was given in the 1999 fish kill
- The burden should be on the fisheries authority to provide replacement fishing gear after proving that it works to the satisfaction of fishers without them taking part in the trials
- The single panel nets were legal for fish, and a by-catch of lobster should be allowed
- The fisheries authority had never proven that trammel or any other nets were harmful
- Sauteurs has lobster and hinds as main fisheries, but the latter alone cannot support fishers
- Negative impacts on households, not only the fishers, must be taken into account

- Compliance with the trammel net ban was easy in other areas that never had to use the net
- Fisheries Officers have no idea about how to co-manage and share decisions with fishers

Although participants on both sides had previously received training in conflict management and negotiation, none of these skills came into play during the exchanges. The fishers refused to make decisions on follow-up at the terminal meeting in order to leave reversal of the net ban decision open for discussion with the minister. However, they did review some of the technical options. Fishers examined and assessed the Canadian rectangular trap on display, and the handout drawings of alternative traps. From the discussion and questions it became apparent that many fishers had less technical knowledge on alternative gear than was evident at the earliest meetings when the matter was discussed without gear examples and drawings based on an assumed level of familiarity with fishing gear. The fishers did not ask for technical information before voicing opinions on the gear. This was likely part of a strategy to continue using trammel nets if reasons could be articulated for rejecting all alternatives. In the scenario where trammel nets were going to be actively prohibited there was more incentive to seek information and explore options. Several fishers quietly expressed interest in trying out any alternatives as long as government provided them, and minimal personal capital investment was required for experimentation.

10.4.1 Options for follow-up on gear selection

Noting that the government's decision was unlikely to be reversed, the project provided fisheries officers with the main options for following up with the search for acceptable alternative gear (Box 10.3).

Box 10.3 Options for follow-up on enforcement of the trammel net prohibition

If the government sticks to its decisions, and does not return to the status quo of ignoring the regulations or changing them to accommodate the fishermen, then several major options for follow-up present themselves. These are in Table 1, and each has several variations and dimensions for consideration. These options are described in the discussion that follows.

Table 1. Some options for follow-up to the lobster net ban

| Options for follow-up | Enforce | Tech. Asst. | Materials | Reward | Testing |
|-----------------------|---------|-------------|-----------|--------|---------|
| Laissez-faire | - | - | - | - | - |
| Compliance | ✓ | - | - | - | - |
| Encourage | ✓ | ✓ | - | - | - |
| Substance | ✓ | ✓ | ✓ | - | - |
| Plus reward | ✓ | ✓ | ✓ | ✓ | - |
| Testing too | ✓ | ✓ | ✓ | ✓ | ✓ |

Laissez-faire

This is the do nothing option. Given the history of the case and reaction to the announcement it is likely that illegal fishing will continue and this cycle of events will be repeated.

Compliance

The focus of this option is solely to ensure compliance with all lobster legislation through more and better enforcement. It would probably require arrests, successful prosecution and heavy penalties over a period of time to convince fishermen to comply fully with the laws. It would be perceived as inequitable if only the Sauteurs trammel nets were targeted by this action. Yet such a focus could be easily defended if this situation was seen as priority. Some fisheries officers say that there has been a decline in bottom fish catches as a result of prolonged

trammel net use, and the fishermen do not appreciate this connection. Unfortunately, research cannot prove cause and effect due to the possibility of other reasons, but the likelihood is high.

Encourage

In addition to enforcement, this option sees the Fisheries Division assisting with the provision of information and advice on alternative fishing gear. The Division would not do the actual trials of gear at sea, but would monitor the efforts of the fishermen and measure gear performance. It is a minimal role for the Division, and their credibility as a technical agency would be in question if this assistance was not given. It could also be the main source of interaction with the fishermen if it is desirable to establish or strengthen collaborative relationships. The Division would need to ensure that its information was accurate, timely, delivered in useful form and constructive. Easy access to Internet and e-mail for communications with companies and other fisheries authorities would be essential. The Division will also require information on managing lobster trap fisheries.

Substance

This is perhaps the option that the Fisheries Division considers most likely, where government provides traps or materials. There are several dimensions. One is whether these supplies are provided only to those who turn in trammel nets or anyone. Is everyone eligible for the same amount, or can different shares be given. The criteria for eligibility need to be clear, clearly understood and the system for distributing the goods equally transparent. Another consideration is that there will be material waste unless the best trap is chosen right away, since several trap designs may have to be tried. The supply scheme also has to have well understood limits and an end; otherwise it could turn into a program for subsidised gear. One of the benefits for having government select and distribute the supplies is that presumably only approved traps will result.

Plus reward

To date there is no indication of what management measures, if any, would apply to the traps. It would be unfortunate to introduce the traps and then realise later that restrictions should have been imposed. An option would be for fishermen to invest in the trap experimentation on their own, but have a certain proportion or fixed amount of their costs reimbursed. A competition for the most successful lobster trap design could be another means of encouraging innovation. Yet another reward system could be a small cash amount or prize for turning in trammel nets in addition to any assistance with traps. The amount would be token and offered for a limited time only. Its purpose would be to encourage trammel nets to be turned in so as to reduce the costs of enforcement by there being fewer potential illegal nets. This would not be a buyback scheme.

Testing too

This is the ultimate option where the Fisheries Division, in addition to everything else, actually conducts experimental fishing with traps, with or without the collaboration of fishermen. For the Fisheries Division to do this, officers would have to be spared to focus on this task, and funds provided for the intense fieldwork that may last a few months. While the Division has officers with the capability, and this sort of work provides a positive image of the authority, the Division may not have the capacity to sustain the effort. This would mean turning again to fishermen to complete the job. It is better that the gear testing be designed and budgeted to be collaborative, and the Division focus on the analysis and interpretation of the trap fishing results, while the fishermen focus on the fishing gear adaptation.

The six options listed above are not the only ones possible, but perhaps the most relevant to consider. The capacity of the Fisheries Division to undertake any option selected is an issue.

10.5 Policy of trammel net prohibition

Two weeks after the announcement of government's decision to enforce the ban on the trammel nets the fishers had an audience with the minister and senior officials as described in Box 10.4.

Box 10.4 Meeting with minister on trammel net prohibition

After the co-management pilot project terminal meeting where fisheries officers announced the ministry's decision to finally prohibit the use of trammel nets the fishers agreed on a strategy to convince the minister to postpone enforcement as no alternative gear had been provided. The cooperative leader made an appointment to see the minister on 30 August 2002 and was accompanied by five fishers. Other fishers expected to form the delegation did not show. The four most senior ministry and fisheries officials were also present.

The fisheries minister opened dialogue by stressing the government's regional and international fisheries responsibilities. She made it clear that the trammel net ban was being enforced due to conservation obligations that transcended local interests, and that this point was non-negotiable.

The fishers rebutted with a reminder of the pilot project co-management agreement to first identify and agree on suitable alternative fishing gear. The minister responded by noting that this was desirable, but not presently feasible since an open-ended timeframe was unacceptable. This matter of (trammel) net regulation non-compliance had already persisted for too long.

The minister turned the discussion immediately to alternative gear and training. Reiterating that nets of any sort would not be allowed for lobster harvest, since this was against the fisheries regulations, the fishers and fisheries authority were directed to arrange training in construction and use of lobster pots. This directive was executed shortly thereafter with ministry funding.

Fishers who attended this meeting reported that the minister's opening arguments supporting enforcement of the regulations, and her swift move on to the alternatives, left them in no doubt that the policy had changed. They became convinced that they should concentrate on finding alternative gear. Unlike previous meetings, there was no tolerance of non-compliance. Soon after this meeting the ministry arranged, and partially funded, three days of training in lobster pot construction and use at the Caribbean Fisheries Training and Development Institute (CFTDI) in Trinidad. Two fishers, including the co-op leader, and a fisheries officer participated.

The two fishers began fishing almost a dozen traps immediately, a few of which got damaged. They believe that they will be able to fish areas nearer the coral more safely with pots, and can do this with less damage than caused by nets. They felt that the other fishers would wait to see if the pots work, and will not argue with or defy government on the regulations until results are evident. Fishers could also be waiting for a leader to break the law in order for more to follow. However the two trained pot fishers also felt that if other fishers saw them landing lobster it would cause confusion and conflict unless government proceeded swiftly to hold a workshop to train the other fishers in construction of the alternative trap. It is likely that use of nets will resume if pots are used, since the source of the lobster would be harder to determine. Lobster divers are likely to be the main people monitoring at sea to ensure that there was no net use. Their reason would be to reduce the competition from nets rather than to conservation.

Fishers noted that government seemed to be delaying in getting materials for additional traps. They think that government wants to spend as little as possible on the pots, so will delay to

encourage fishers to spend their own money on adopting the alternative gear. On the part of the fisheries authority, there is no evidence that demonstrating alternative fishing gear is of high priority. Attempts are still being made to arrange the training in lobster pot construction and use for all of the fishers, but some fisheries officers remain convinced that it would be better for the fishers to devise their own alternatives. They are convinced that the capacity to do this exists at the level of key innovative individuals, and that diffusion of innovation would soon follow if these fishers were successful. The role of the fisheries authority in such a scenario would be mainly to monitor and ensure that any introduced new or modified gear complies with the regulations.

11 Outcomes and performance of co-management arrangements

The decision of government to initiate co-management in this case was prompted by necessity. The lobster fishers did not share the sense of necessity and urgency. Government, due to its inability or unwillingness to enforce its fisheries regulations, sought the cooperation of fishers in identifying and implementing alternative fishing gear and methods after it became obvious that turning a blind eye to illegal practices had to end.

To its credit, government did not seek to use the command and control approach of vigorous enforcement. Perhaps the main reasons for this were the difficult logistics of such enforcement and the likely political backlash that is common in the Caribbean when laws are enforced against segments of the population that are popularly perceived as poor and defenceless (e.g. fishers, landless farmers and squatters).

Although the co-management pilot project was reasonably well designed, its implementation period was unrealistically short for the objectives that were set. In particular, there was not enough time allowed for the acquisition of test fishing gear and the collaborative activities of gear trials that should have assisted in strengthening the relationships between the fishers and fisheries authority, perhaps whether they were successful or not. Prolonged joint activity may also have reduced the tensions between the parties that were evident at the start due to a history of mistrust and poor communication.

Because of the several problems experienced in implementing the project the government was forced to take a decision on whether to allow the illegal activities to continue or to announce its enforcement of regulations that had been defied for some time. Although the fishers had enough time over the years to devise their own solutions to the prohibition of their preferred fishing gear, they took no action. They considered government's inability to provide them with alternatives in a short space of time to be a breach of the co-management agreement. In many ways their objections were mainly to test the political and managerial strength of decision-makers. They accepted, and have apparently respected, the firm decision to enforce the net ban.

However, as a result of these, generally negative, interactions there seems to be little overall progress in the implementation of co-management for the lobster fishery based at Sauteurs in Grenada. The lessons on conditions for success have more to do with what to avoid, especially poor communication, and to beware the absence of a good social and cultural fit.

12 Conditions for successful co-management

The purpose of this project was to suggest mechanisms for the implementation of integrated pro-poor natural resource (and pollution prevention) management in coastal zones that could be developed and promoted through understanding the requirements for establishing successful

co-management institutions for coastal resources under various conditions in the Caribbean. In this chapter we present conclusions based on the research framework that guided the study.

12.1 Type of co-management

The research framework summarises the main types of co-management as consultative, collaborative and delegated. This experiment in co-managing the lobster fishery at Sauteurs was a governmental approach to problem solving, the problem being the refusal of fishers at this one location to stop using illegal fishing gear. Government regarded co-management as an instrument for obtaining compliance and conducting business more efficiently and sensitively than by command and control measures. Delegated co-management was not feasible or contemplated since the local fishing cooperative is very weak and struggling to rebuild. The project plan anticipated collaborative co-management, but for logistic and other reasons the result was a very limited form of consultative co-management fairly typical of the approach to fisheries management in Grenada. Although this is institutionally weak, both the fisheries authority and fishers appear to be comfortable with this fairly loose arrangement.

12.2 Phase of co-management

This case illustrates the very first stages of pre-implementation in which the co-management arrangements, the stakeholders, and their patterns of interaction are flexible and uncertain. It is unlikely that this case will advance beyond this phase in the near future, and it is possible that it will return to a more unmanaged, or a command and control, state unless there is more interest in establishing co-management.

12.3 Conditions for co-management

This final section is based on findings that have been presented above and on the proceedings of a special workshop of stakeholders in this case study where they were asked to discuss and evaluate a list of variables presented to them by the researchers based on previous research on co-management. In this process the workshop participants had the opportunity to add or delete variables that they found to be critical or irrelevant respectively.

The Grenada workshop on the critical conditions for successful co-management included researchers, Fisheries Division, fishing cooperatives, Cooperatives Department and a private consultant. The proceedings of the meeting are summarised in Table 12.1.

Table 12.1 Stakeholders perceptions of critical conditions for success in Grenada

| 0 = absent; 1 = present but weak; 2 = present to a fair extent; 3 = strong feature of the fishery | | |
|---|--|---|
| CO-MANAGEMENT CONDITION | REMARKS | # |
| 1. Clearly defined boundaries: of the resource; of the management area; of the "community" | <ul style="list-style-type: none"> • Know lobster fishing areas only generally, not clearly bounded • Know who are lobster fishers and where from • Management areas generally known but not clear • Fishers not constrained by boundaries but Sauteurs fishers mingle with Carriacou but go little farther • Grenada and Carriacou divers go into SVG waters • Fishers go as far as fuel will take them • SVG-Grenada boundary not really a barrier • National boundaries functionally unclear, but are | 1 |

| CO-MANAGEMENT CONDITION | REMARKS | # |
|---|---|-----|
| | declared under UNCLOS without delimitation <ul style="list-style-type: none"> • Seasonal boundaries to fishing pelagics • People switch fisheries so few technical boundaries | |
| 2. Membership is clearly defined as to who really has a stake in the fishery (is a stakeholder) | <ul style="list-style-type: none"> • Fishers interchange amongst fisheries but easy to tell who is in which fishery • All stakeholders well known | 3 |
| 3. There is shared recognition of a resource use problem that needs to be addressed | <ul style="list-style-type: none"> • Fishers recognise problems and tell FD e.g. marketing of tunas • Seldom sure about government action in response • Fishers usually identify external problems rather than problems or causes amongst themselves • Fishers seldom find resource problems that they cause • Fishers look for problems for government to solve • Extent of problem recognition not spread evenly across stakeholders • Different perspectives on problems recognised • Root causes of problems harder to agree on | 2 |
| 4. Clear objectives for management can be defined based on the problems and interests | <ul style="list-style-type: none"> • FD management objectives are clear in draft Fisheries Management Plan • Mostly known by fishery managers e.g. reason for sea egg size limit to protect spawners that fishers objected to at first then admitted error of objecting | 3 |
| 5. Good fit between the scale of the resource and feasible management arrangements | <ul style="list-style-type: none"> • Fishers think that government does not have enough information and that resources are unmanageable since nature not controllable • Without clear boundaries it is hard to judge scales | 1/2 |
| 6. Management approaches and measures are flexible to suit changing circumstances | <ul style="list-style-type: none"> • Fishers think management measures are rigid in practice even if flexible in theory • Fishers do not know enough about management measures to know which are flexible or not and why • Fishers do not understand what may cause some measures to change • Flexibility varies but insufficient information to inform changes | 2 |
| 7. Cooperation exists, and is adequate, at the resource user level and in government etc. | <ul style="list-style-type: none"> • Fisherfolk usually cooperate by participating in consultations • Need more cooperation between Cooperatives and Fisheries Divisions • Fair relations between Cooperatives and fishers | 2 |
| 8. Leadership exists, and is adequate, at the resource user level and in government etc | <ul style="list-style-type: none"> • FD designates extension officers to lead in areas but they are not often seen • Leadership weak among fishers as seen in Sauteurs case • Leadership demonstrated everywhere for Fisherman's Birthday celebrations but not sustained into other initiatives • Formation of coops is demonstration of leadership • Single leaders may arise but no succession plan | 2 |
| 9. Group cohesion where fishers, managers and others can act collectively within their groups | <ul style="list-style-type: none"> • Cohesion weak among fishers – quarrel over money matters especially • Fishers do not understand their role in a group as | 1 |

| CO-MANAGEMENT CONDITION | REMARKS | # |
|--|--|---|
| collectively within their groups | <p>expect others to take action. Freeriders.</p> <ul style="list-style-type: none"> Expect too much of leaders without their support | |
| 10. There are mechanisms for managing conflicts within and among stakeholder groups | <ul style="list-style-type: none"> People are insular but no conflicts between geographic areas Managed due to culture of reconciliation Government agencies conflict over areas of jurisdiction e.g. beaches and planned beach mining by Public Works on Levera turtle nesting beach Any mechanisms are informal | 1 |
| 11. Communication amongst the stakeholders is effective, and there is adequate networking | <ul style="list-style-type: none"> No big communication s problem Fishers tell FD about problems regularly, but feedback on action taken is less regular Getting better through more workshops | 2 |
| 12. Coordination between government, local community and other stakeholders is effective | <ul style="list-style-type: none"> Coordination to mobilise fishers to workshops good Fair coordination among government agencies and some NGOs Lower between FD and government? | 2 |
| 13. Trust and mutual respect characterise the relationships among the key stakeholders | <ul style="list-style-type: none"> Little respect among fishers for themselves e.g. those working against formation of the new Gouyave cooperative Government agencies have professional respect for each other; and fair between FD and government Fisheries Officers have respect for fishers due to the demands of their occupation Not sure of respect for fisheries officers | 2 |
| 14. Organisational capacity exists for all stakeholders to participate effectively in management | <ul style="list-style-type: none"> FD has capacity to organise for management but not the logistics to execute Fishers may not have enough information to participate in management Dual roles for FD regarding enforcement and training is a conflict due to small capacity | 1 |
| 15. Adequate financial, and hence physical, resources are available for management tasks | <ul style="list-style-type: none"> Government and fishing industry may lack resources to manage physically Funding may be scarce or inaccessible | 1 |
| 16. External agents provide support for management but do not encourage dependency | <ul style="list-style-type: none"> In MPA by French funders there was requirement of sustainability Support from ESDU, but not many other agencies Japan is major donor | 2 |
| 17. Benefits of participation must exceed costs from the levels of individuals up to larger groups | <ul style="list-style-type: none"> Neither costs nor benefits are assessed / measured Costs are perceived to be high, but benefits are a mystery (unidentified and unmeasured) Clearest benefits where there is a crisis | 1 |
| 18. Individuals, groups affected by management arrangements are included in decision-making | <ul style="list-style-type: none"> Previous legislation (colonial) was top-down Now more consultation on management decisions E.g. MPA regulations consultations resulted in compromises such as expanding Molinere MPA to beyond reef to include Beausejour seining beaches and yacht anchoring areas to reduce conflict Stakeholders did not actually make decision but helped Also industry had strong say on duty concessions | 2 |

| CO-MANAGEMENT CONDITION | REMARKS | # |
|---|---|---|
| 19. Management rules are enforceable by resource users and the management authority | <ul style="list-style-type: none"> High compliance in some areas but in others the fishers frustrate rules being enforceable Collusions to break the law where fishers inform others of enforcement Fishers also inform on others if they have financial gain to make from it. Competition effect. | 2 |
| 20. Legislation gives users some meaningful level of ownership or control over resource use | <ul style="list-style-type: none"> Open access fisheries; some traditional seine rules Licensing system not management oriented yet | 0 |
| 21. Legislation gives users authority to make management decisions, perhaps shared | <ul style="list-style-type: none"> Provision for a FAC but not functional for some time | 2 |
| 22. Decentralisation and delegation of authority is part of the policy of resource management | <ul style="list-style-type: none"> Not part of policy or practice Groups in industry not strong enough to take on responsibility | 0 |
| 23. Co-management has a good social and cultural fit to the circumstances of the situation | <ul style="list-style-type: none"> May not be a good fit as people expect government to work for them and do much once asked People expect government to solve most problems Attempts to work inter-agency at government level Poorer relation between government and fishers Will have to fit better in the future since government resources are scarce with limited capacity and goals cannot be reached without user support Providing more information from FD to industry would help e.g. promoting the Code of Conduct | 1 |

12.3.1 Boundaries

One boundary of Grenada's marine jurisdiction lies just north of the study site, and some lobster divers venture across into the waters of St. Vincent and the Grenadines. This does not apply to Sauteurs trammel net fishers. The boundaries of the lobster stock fished in the waters of Grenada are poorly known, but Cochrane and Chakalall (2000) place the country within the area of the loosely defined southern stock that includes all of the Lesser Antilles down to mainland South America. The lobster fishing grounds are well known and coincide roughly with the island shelf. Technology also served as a boundary. Before use of the trammel net, Sauteurs fishers who could not dive were excluded from making the lobster fishery their mainstay. As new gear is introduced there is the potential for technology to again become a significant boundary. The boundaries are adequate for establishing co-management.

12.3.2 Membership and stakeholders

Who the lobster fishers are is fairly well defined, but there are no formal or informal barriers to fishery entry or exit. Stakeholders in this case include the Fisheries Division, St. Patrick's Fishermen's Cooperative and the individual fishers. The Cooperatives Division and SPOD are interested parties, although they have never articulated a specific interest in the lobster fishery itself. Their interest comes from roles in promoting collective action and community empowerment respectively. Although the enforcement agencies are potential stakeholders in this case of illegal fishing gear, their involvement is activated mainly through the Fisheries Division rather than through their own volition. Should the major luxury tourism projects materialise at Levera, the stakeholders may expand to include actors in this likely market for the

catch. Any additional stakeholders entering this institutional arena are likely to be secondary to the fishers and fisheries authority.

12.3.3 Resource use problem

There are different views on the nature and seriousness of the resource use problem. The Fisheries Division considers the use of destructive gear to be a serious problem especially in the destruction of habitat and from a long-term perspective. The fishers consider it less serious because they claim that the average size and abundance of lobsters have not declined since using the nets. Several agree that the damage to habitat is unfortunate, but consider this less important than their immediate need to earn their livelihoods from the fishery in the simplest manner possible. The resource use problem must be acknowledged more widely and openly by the fishers for genuine attempts at problem solving to be undertaken collaboratively.

12.3.4 Management objectives

There is a recent draft management plan, but only the author, a former Chief Fisheries Officer, is particularly familiar with its contents or is able to champion its approval by the policy-makers. The management objectives that currently apply to the lobster fishery are not very clear. The management objectives need to become both clear and shared for stakeholders to determine the most appropriate approach to management.

12.3.5 Scale of management

Regional or sub-regional management of Caribbean spiny lobster fisheries is required given the long planktonic phase of the animals and wide dispersal of young. The choice of implementing co-management specifically at the small scale of Sauteurs alone was related to the type of fishing gear and not the catch. The scale selected was appropriate to the problem being addressed, but not the overall management of the fishery. Any attempt to establish co-management of the fishery nationally will necessitate a larger scale of management. A more fundamental issue is whether fishers will share the perspective that the fishery can be managed at any scale. Fishers appear to be sceptical about the feasibility of management in general.

12.3.6 Management adaptation

The fisheries authority demonstrated willingness to adapt management measures by agreeing to use the research provisions in the fisheries regulations to test the single panel nets in order to get firsthand data on their performance. This decision was overturned later by the ministry's management committee, which decided that the letter of the law that banned nets was inviolate. Both levels of decision-making must therefore been taken into account, and the flexibility to adapt may be reduced as the level in the policy structure increases. Regarding the fisheries regulations, as a result of interventions by the Fisheries Division there have been amendments since their original passage. This suggests a willingness to make regulatory changes, but for co-management to be efficient more responsive mechanisms for management adaptation will be required. The current case illustrated this need.

12.3.7 Cooperation

The Fisheries Division assessed cooperation as satisfactory based on the willingness of fisherfolk to participate in the events it organised. However fishers at Sauteurs were clearly less than satisfied with the performance of the Fisheries Division in responding to their need for alternative gear and training in its use. The demands of the fishers were seen as unnecessary given the experience of several with various types of fishing that had been done prior to the introduction of the nets. The Fisheries Division was sensitive that being overly cooperative could

have negative impacts on the fishers' self-reliance and problem solving such as by fostering dependency. There was universal agreement that more cooperation was needed between the Fisheries Division and Cooperatives Division, but no mechanism for this was available. Given the recent increased interest in promoting fishing cooperatives, and the apparent demand from fishers for this type of organisation, this deficiency could become a major obstacle.

12.3.8 Leadership

At a workshop on leadership that included fishing industry and fisheries authority participants, Sauteurs fishers involved with the revival of St. Patrick's Fishermen's Cooperative noted that the cooperative had been through several leadership crises. Various agencies that attempted to assist the cooperative over several years had little impact on improving leadership. The leader of the cooperative was also the leader of the lobster fishers during the case study. In his absence an older and experienced fisher substituted (e.g. signing the co-management pilot project agreement). Another experienced fisher was a co-leader in organising the Fisherman's Birthday celebrations. Fishers have led delegations to meet the minister. There seems to be no lack of leaders in terms of fishers respected by others, but their abilities to mobilise and organise the fishers into a vibrant body are inadequate. It is an area in which strengthening is required.

12.3.9 Collective action

The fishing cooperative is the most relevant expression of formal collective action in this case, but its history is not one of success. However, there have been significant instances of informal collective action. For example, in the mid-90s the fishers were invited by the Chief Fisheries Officer to advise on the most appropriate penalty for a fisher who was guilty of fishing out of season with a trammel net. They collectively provided their advice on an appropriate fine. In the last two years, the delegations that visited the minister to discuss the suspension of enforcing the net ban regulations also illustrate that the fishers are capable of focused collective action if motivated. The challenge would be to sustain collective action in the co-management context.

12.3.10 Conflict management

Little conflict was reported within the trammel net lobster fishery. In a workshop on conflict management and negotiation that included fishing industry and fisheries authority it was clear that no formal conflict management mechanisms existed. Within the community of Sauteurs there were no systems for informal management of conflict if the disputing parties cannot solve problems themselves. In the leadership workshop the participants revealed that persistent, but low-level, grievances were barriers to forming a cohesive body. Throughout the project activities the fishers demonstrated an underlying current of conflict with, and distrust of, the fisheries authority. This was particularly clear in several workshops, but especially when the decision to uphold the fisheries regulations was announced. Fisheries officers are sometimes called upon by fishers and vendors to mediate in disputes but are untrained and unprepared for such tasks. There was much concern about the neutrality of persons asked to assist in managing conflicts since it was felt that within this small community of fisherfolk any such person was likely to have, or to develop, an interest in the outcome that could be unfair to the other party or parties. It was also said that fisheries officers were interested in short term ends to conflicts that could result in underlying causes being missed. As a consequence, conflicts resurface or remain unresolved. If co-management is to succeed, more attention must be paid to conflict management.

12.3.11 Effective communication

The Grenada fisheries authority has invested heavily in both formal and informal communication that has proven effective. The system of extension officers allocated to particular parishes has resulted in close relationships between particular officers and the fishers in these locations. The fishers appreciate this relationship and communicate with officers regularly. However, several fishers pointed out that this informal camaraderie is insufficient in that it does not facilitate formal inclusion of their issues and answers into the fisheries decision-making system. They want to have more formal meetings, and especially to receive feedback from the Fisheries Division on matters raised previously. Communication between the Fisheries and Cooperative Divisions is negligible and needs to be improved if cooperatives are to have management roles.

12.3.12 Coordination

Arising from communication, there is reasonable coordination at the technical level between NGOs, government and the fishing industry. Post-hurricane recovery, regular workshops and other events are examples. However there is less coordination between the technical and policy levels of government on fisheries matters. The fisheries authority's uncertainty about policy decisions and support is likely to retard its advance towards co-management since the latter is much more characterised by policy and politics than conventional management.

12.3.13 Trust and respect

The only area in which trust and respect was said to be in short supply was among fishers themselves, as demonstrated by conflict and disunity that appear to hinder development and collective action. The dynamics of leadership in the fishing cooperative is an example. It is not likely, however, that levels of trust and respect are so low in the fishing industry as to seriously constrain the success of fisheries co-management.

12.3.14 Organisational capacity

Capacity building is an important element in co-management. Where the poor have access to resources that create new and more relevant capabilities among them, they are usually better equipped to extricate themselves from poverty and sustain livelihoods. Such capacity building may include, but is not limited to, training and upgrading of skills, and empowerment. NGOs were very actively involved in trying to create capacity in fishing organisations up to a few years ago. These efforts have now subsided and organisational capacity is still very limited. Several key organisations have failed. The Fisheries Division is limited in its capacity. The two main NGOs that have assisted fishing groups claim limited capacity constrains their operations. Means of strengthening the organisational capacities of all stakeholders must be devised.

12.3.15 Financial resources

Since expenditure on fisheries management is one of the matters that concerns policy-makers it will be important to ensure that operational decisions are not thwarted by lack of coordination at the policy level, such as appeared to have happened with the delay in using government funds to acquire the lobster pots. The Fisheries Division does not have significant financial resources to support co-management. External assistance in mounting demonstration projects may be needed to facilitate government providing a larger allocation to fishing.

12.3.16 External agents

Grenada has received external funding for physical infrastructure that improves the working conditions and livelihoods of fisherfolk. These improvements are likely to continue. Previously,

NGOs received external funds that were passed on to fishing industry initiatives. None of the external interventions has encouraged dependency, and further assistance specifically for co-management would be beneficial.

12.3.17 Net benefits

Benefits from the Sauteurs project were less than planned in terms of demonstrating co-management. The project continues as a regular government initiative and any success in reducing or mitigating habitat destruction is likely to be valuable but not easily measurable. Trammel net lobster fishers have abandoned their illegal gear and do not have an approved alternative. Some claim that the government is trying to minimise costs in providing alternative gear, and shifting the burden of innovation onto them. The absence of clear benefits to the fishers is likely to be a serious constraint on them adopting new fishing gear or co-management.

12.3.18 Representation in decision-making

The fisheries authority has not established a system in which fishers are locally or nationally formally represented in a decision-making forum. Fisheries officers have good relationships with fishers and will seek their advice in formal or informal consultation, but this stops short of decision-making. The fishers, largely through the efforts of the cooperative leader and a vocal few, have been fairly successful at representing themselves before the Minister responsible for fisheries. In doing so they have tended to bypass the fisheries authority in order to have policy directives that are favourable to them imposed on the authority by the Minister. The several unsuccessful attempts to establish a Fisheries Advisory Committee demonstrate fundamental difficulties in forming and maintaining a representative decision-making body. This needs to be addressed for co-management to be successful and, given the prevalence of parish level bodies, perhaps success could first be achieved at this smaller scale of administration.

12.3.19 Enforcement

The continued illegal use of trammel nets for lobster harvest, to the point of obtaining policy sanction for their activities, reveals the power that the fishers have in controlling the level of enforcement when they refuse to comply with fisheries regulations. Although Sauteurs is a fairly remote location, the capacity to enforce is less of an issue. Like elsewhere in the Caribbean the fisheries regulations are complied with mainly voluntarily, and enforced only infrequently. In the case of using a co-management approach to change fishing methods it is vital that there be the provision to strictly enforce the points of agreement and law as a basis for trust and compliance.

12.3.20 Property rights

The lobster fishery is open access. There are no reported established property rights associated with preferred lobster fishing grounds, but fishers are known to have their favourite locations. In Grenadines areas where lobster fishing (diving or net) and recreational diving coincide there is voluntary separation of activities in order to avoid congestion and conflict. Stealing from nets or lobster holding areas was not raised as a major concern. In the beach seine fishery there is a well-developed customary system of rights by fishing location. Therefore the concept of territorial rights is not new to the fishing industry. It may be beneficial to use the opportunity of introducing new gear to examine the feasibility of rights regimes.

12.3.21 Sharing decision-making

There is legal provision for a Fisheries Advisory Committee, but several attempts to form and maintain one have not been successful. There is no other process or institution except the meetings of the various cooperatives and associations. At Sauteurs the cooperative has not yet

revived to the point of taking on fisheries management decisions, although its leader sees that the potential exists. The pilot project included the setting up of a multi-stakeholder working group to guide and oversee operations. Members were readily selected for this group but it did not function. This may be partly due to the logistic problems experienced in executing project fieldwork, but there also appeared to be the belief shared by fishers and fisheries authority that such a structure was unnecessary. The Fisheries Division and fishers accept top-down management with consultation as the norm. Both resist more collaborative decision-making.

12.3.22 Decentralisation and delegation

In the fisheries arena there is no evidence that decentralisation and delegation of power to the fisheries authority or fishing industry is likely to occur. The Fisheries Division is closely wed to the administration of the ministry in decision-making. The long list of consultations conducted by the Fisheries Division with the industry do not exhibit any move towards delegation and there are no structures set up to receive the consequent responsibilities. Given that an area like Sauteurs is fairly remote from the centre, some level of decentralisation should facilitate the success of co-management if the necessary structures were put into place.

12.3.23 Social and cultural fit

Grenada has experienced more political changes than several neighbouring countries, including a socialist phase. This period and colonialism were characterised by the governments taking charge, although the formation of grassroots organisations was a feature of the socialist era. The expectation remains that government has the bulk of responsibility to make decisions and look after the welfare of the people. Co-management beyond consultation is not a good fit at present in the fishing industry, but there is scope for much improvement in consultative co-management that would not be inconsistent with the socio-cultural environment.

12.4 Priority action

The priority action in this case is to establish better communication between the fisheries authority and the fishers. Much of this may be accomplished by undertaking joint activities. First among these should be the gear trials and training, including the analysis and interpretation of data collected. The revival of the cooperative should result in more sustained collective action and the building of capacity necessary for the fishers to have a role in resource management. In order for them to proceed, awareness of the benefits of responsible fishing must be increased and the draft fisheries management plan completed with clear responsibilities for all stakeholders.

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14 Appendices

14.1 Appendix 1: Project case study summaries

14.1.1 Barbados

Sea egg fishery — A food fishery for white sea urchins (*Tripneustes ventricosus* locally called "sea eggs") has declined on several occasions. After several closures to facilitate recovery, the government recently initiated co-management. Stakeholder groups include the Fisheries Division and Coastal Zone Management Unit (CZMU) of the government; and the Barbados National Union of Fisherfolk Organisations (BARNUFO).

Fisheries Advisory Committee — Under its 1993 Fisheries Act the government of Barbados activated a multi-stakeholder Fisheries Advisory Committee in 1995. The FAC has struggled to define and meet its co-management mandate. Stakeholder groups include the Fisheries Division of the government; individual and organisational members of the FAC.

14.1.2 Belize

Laughing Bird Caye National Park and Gladden Spit Marine Reserve MPAs — These MPAs in Belize's barrier reef are co-managed by an NGO under co-management agreements with the Forestry and Fisheries Departments. Government stakeholders include the Fisheries and Forestry Departments, Coastal Zone Management Authority and Institute. Friends of Nature, Belize Tourism Industry Association and Belize Fisherman's Cooperative Association are some of the NGOs.

Fisheries Advisory Board — Belize has a Fisheries Advisory Board (FAB) that has been a powerful force in fisheries for over 30 years. However, it has not been well documented as an example of co-management. Stakeholder groups include government Fisheries and Cooperatives Departments, Belize Fisherman's Cooperative Association, members of the FAB.

14.1.3 Grenada

Lobster fishery (focus on Sauteurs location) — At the rural town of Sauteurs government recently started a co-management project to encourage use of more responsible fishing gear for lobster harvest, and the fishing co-operative in the area is presently being revived. Stakeholder groups include government Fisheries and Cooperatives Divisions, the Agency for Rural Transformation, St. Patrick's Fishermen's Co-op.

Seine net fishery (focus on Gouyave location) — The seine net fishery in Grenada is a case of an attempt by government to systematically document traditional fishing rules and customs in order to incorporate them into fisheries management plans and legislation. Stakeholder groups include the Fisheries Division of government, Agency for Rural Transformation, Grenada Community Development Agency, Gouyave Improvement Committee and St. John's Fishermen's Association.

14.2 Appendix 2: Draft lobster management and implementation plans

14.2.1 Lobster management plan

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| Target Species | Caribbean Spiny Lobster (<i>Panulirus argus</i>) |
| Ecology | <p>Distribution – Larvae are planktonic for about six (6) months; Juveniles inhabit coastal habitats such as sea grass, mangrove and coral rubble in protected bays; Adults usually prefer deeper water and offshore reef habitats; Adults usually found in rocks and coral rubble between 4 to 20 m, but maximum depth unknown.</p> <p>Growth – Lobsters grow by moulting. Length of intermoult period averages from 60 to 90 days. Males grow about 3 cm. Per year and females at about half this rate due to egg production and care. Males mature in about 2 yrs. And females in 4 yrs. Maximum size by both sexes in about 10 yrs.</p> <p>Life Span – Over 10 yrs.</p> <p>Reproduction – Spiny lobsters move to the edge of the shelf to spawn. In the Caribbean, berried females can be found at any time during the year. Larvae have long planktonic stage during which most distribution takes place.</p> |
| Description of Fishery | <p>Economic importance – Major fishery (not in terms of volume but value) with potential for increased importance through the Tourism industry.</p> <p>Fishing gear and methods – Free and SCUBA diving using loops (noose) and Trammel nets</p> <p>Vessel type – Small pirogue type with outboard motors. Usually < 7 m.</p> <p>Landing sites – Three major and many minor landing sites. Marketed at landing sites, hotels, restaurants and exported.</p> <p>Employment – Approximately persons involved in the fishery.</p> |
| Management Unit | <p>Management units for lobsters should be considered at two levels:</p> <ul style="list-style-type: none"> - The island shelf which relates to the distribution of demersal juveniles and adults - The wider Caribbean relates to the likely interaction of regional stocks through planktonic early life history |
| Resource Status | Lobster populations are close to or overexploited (yield decrease |

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| | dramatically close to the end of the open season) |
| Effort Catch and Trends | |
| Management Policies and Objective | To promote the sustainable harvest of lobsters for local (tourism market) use and export in order to achieve economic benefits over the long term. |
| Regulatory History | Grenada Fisheries Regulations SRO 39 of 1987 Minimum size limits; Restrictions on fishing gear (by hand, pots, loop and traps) Restrictions on taking berried females or moulting individuals. Closed season (May 1 st –Aug 31 st) Ban on landing dead lobsters |
| Management Approaches | Enforcement of existing regulations Project to obtain suitable alternative gear for fishermen of Sauteurs (presently use trammel nets) |
| Constraints | Not much information on the present populations Landings difficult to monitor especially in the southern part of the island (illegal fishing during the closed season) |
| Opportunities | Markets exist with high demand and price. Use of artificial habitat (e.g. casitas) may improve yield |

14.2.2 Lobster implementation plan

| ISSUES IDENTIFIED | ACTION STRATEGY | RESOURCES REQUIRED |
|--|---|--|
| Habitat degradation and destruction | <ul style="list-style-type: none"> - Expand marine protected areas after consultation. - Programme of action to decrease land-based sources of pollution | <ul style="list-style-type: none"> - Time for inter-agency and stakeholder forum - Equipment and personnel for increased enforcement and area management |
| Possible increase in yield through basic management (co-management) | <ul style="list-style-type: none"> - Implement/enforce fisheries regulations - Public education - Ban the use of trammel nets | <ul style="list-style-type: none"> - Fund for Public Education programme - Equipment and personnel for improved enforcement and management |
| Inadequate fishery and statistic information for planning and management | <ul style="list-style-type: none"> - Improve estimation of catch and effort data - Collect biological, economic and social data - Collaboration on data collection with fishers and students - Stock assessment studies | <ul style="list-style-type: none"> - Funds for public education - Equipment and SCUBA training to conduct underwater survey - Scientific literature |
| Institutional arrangement for managing this fishery not fully developed. | <ul style="list-style-type: none"> - Explore possible institutional arrangements in collaboration with all stakeholders - Implement the preferred arrangement(s) as a pilot project for trial and evaluation to improve | <ul style="list-style-type: none"> - Access to institutional research partners, fishing industry cooperation and stakeholder collaboration for pilot projects |