

**GOING PLACES:**

**THE CASE OF**

**THE SOUFRIERE MARINE MANAGEMENT AREA (SMMA),**

**SAINT LUCIA**

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## **EXECUTIVE SUMMARY**

The case of the Soufriere Marine Management Area (SMMA) in Saint Lucia demonstrates the use of, and need for the ecosystem approach as a strategy for the integrated management of land, water and living resources, that strives to promote conservation and sustainable use in and equitable way. The management of the SMMA is a dynamic, transitional, evolutionary process that constantly responds to a number of pressures and changes, including social, cultural, economical, political, legal, institutional, industrial and natural and anthropogenic factors. All these place strain on fragile coastal and marine habitats. This is demonstrated through a discussion of the circumstances leading to, and continuing to evolve, in the development of the SMMA, including accounts of many of the struggles and achievements. The use of zoning as a management tool is presented and the SMMA is put forward as an example of access and benefit-sharing, where multiple uses are supported in a system that strives to optimise economic, social and ecological benefits, so that conservation and 'development' are more compatible. The need for a supportive institutional and legal framework is demonstrated, which allows the SMMA to operate in a way consistent with a shared vision and clear mission. Management of the use of marine and coastal resources in Soufriere is seen to be an adaptive, flexible, learning process, requiring very collaborative forms of management and partnerships. While many lessons have been learnt, there are no ready answers or easy solutions for the many issues that can, and do arise when dealing with 'people management'. While the SMMA has accomplished much, it has a limited sphere of influence and some of its problems cannot be addressed in isolation; but its sphere of influence is beginning to broaden. There are several initiatives in Saint Lucia that have impacted positively on management efforts within the SMMA and new ones are underway. Indeed, the actions taken by Saint Lucia, the Soufriere community and the SMMA, the effects of natural occurrences and external influences and the extent to which the ecosystem approach is applied, will determine trends in natural resource management and the future of coastal zone management for the area and for the island as a whole.

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# **1. INTRODUCTION: OVERVIEW OF SOUFRIERE AND THE SMMA**

The valuable, but scarce marine resources of the Caribbean island of Saint Lucia (see Figure 1 for location of Saint Lucia) have long been recognised as being worthy of conservation and protection. As a volcanic isle with a mountainous interior, the country's population and most of its economic activities are found along a narrow coastal strip. The coastal area, in turn, contains a narrow underwater shelf that supports the island's nearshore fisheries resources.

The town of Soufriere, located midway along Saint Lucia's west coast (Figure 2), is a picturesque community known for its famous twin volcanic peaks (the Pitons), waterfall (Diamond Falls), drive-in volcano (Sulphur Springs), old growth rain forest and spectacular coral reefs. The coastal area of Soufriere has traditionally been an important fishing zone for fishers using pots/traps, seines, lines and gillnets. With the rapid evolution of the tourism industry, use of the coastal zone has expanded to include yachting, SCUBA diving, snorkelling and coastal sightseeing. Thus, the traditional resource users (the artisanal fishers and the recreating locals) now have to share the use of this limited coastal zone with the newcomers, a situation that has often led to verbal and even physical disputes.

The first effort to alleviate the pressure on the fragile and limited resources, reverse trends of decreasing economic opportunity and mediate conflicts among resource users in Soufriere was led by the Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries, in 1986. Under this initiative, the Department of Fisheries used regulatory mechanisms, that is, the establishment of marine reserves and fishing priority areas. However, this was largely unsuccessful, due to the lack of resources to enforce management regimes and the non-involvement, inadequate consideration and consequent non-commitment of local stakeholders. This was followed by a more collaborative and participatory process over an eighteen month period, initiated through the combined efforts of the Department of Fisheries and two non-governmental organisations, the Caribbean Natural Resources Institute (CANARI) and the Soufriere Regional Development Foundation (SRDF). This process led to an agreement being reached among key stakeholders on the management objectives for the area (SRDF, 1994 b), and the subsequent, official establishment of the Soufriere Marine Management Area (SMMA) in July 1995 (see Figure 2 for general location of the SMMA and Figure 3 for zoning within the SMMA).



Source: SMMA Website, 2006

Figure 1: Location of Saint Lucia in the Caribbean





*Source: SMMA Website, 2006*

**Figure 2: Location of Soufriere and the SMMA in Saint Lucia**

## **2. THE COASTAL ZONE IN SOUFRIERE**

### **2.1 The Fishing Sector in Soufriere**

It is necessary to provide an overview of the fishing sector in Soufriere to allow for the understanding of many of the issues relating to the SMMA. Soufriere has an estimated population of 7,665, with 152 persons per km<sup>2</sup> out of a total population for the island of 151,143 (GOSL Statistical Department, 2001). There are 164 registered fishers in Soufriere, out of a total registered number of fishers for the island of 2,267. The fishers are mostly full-time, that is, 62 part-time and 95 full-time. There are also 7 boat owners who are not, themselves, actively engaged in fishing, but whose vessels are involved in fishing activity. One hundred and seventeen (117) fishing vessels operate from the town, out of a total of 680 for the island<sup>1</sup>. The small, open vessels, from which the fishers operate, reflect an artisanal-type of fishing. A total of 103 tonnes of fish was landed in Soufriere in 2005 out of a total of 1,386 tonnes for ten landing sites (DOF Data Management Section, 2006).

Soufriere's fish catch comprises mainly coastal pelagics such as jacks, balao and sardines, as well as reef species and flying fish. Contrary to this nearshore type of fishing characteristic of Soufriere fishers, fishing communities to the northwest, east and south of the island have become focused on offshore fishing for migratory pelagics (e.g., tunas, kingfish, and dolphinfish), particularly during the first half of the year (DOF Data Management Section, 2006). Soufriere has been slow to follow this trend, due its location furthest from the migratory routes of the valuable pelagics. The significant distance that fishers need to travel to access such resources, leads to additional time and operational costs (fuel), and demands investment in high-powered engines and improved gear and methods. Such factors have discouraged the majority of Soufriere fishers from making the transition into offshore fishing (George, 1996; Pierre, 2000).

In addition to the above constraints, Soufriere fishers have had to contend with the rapid growth in the tourism sector. While the benefits of such tourism accrue to the local restaurateurs, hoteliers, taxi operators (water and land based), dive operators, charter boat companies and sightseeing operations, there has been little direct benefit of tourism expansion to the Soufriere fishers. In fact, fishers were the users most affected by the formation of the SMMA, through the loss of prime fishing areas.

### **2.2 The Conflicts and Problems**

Prior to the formation of SMMA, there was much competition among users for limited space and resources. The conflicts and problems arising thereto are outlined as follows (George, 1996; SMMA, 1998; Pierre, 2000; Pierre-Nathaniel, 2003, 2006):

- Yachtsmen and fishers competed for the use of marine space to engage in mooring and seining activities, respectively.

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<sup>1</sup> The Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries conducted a verification exercise of its database of registered vessels in 2003. This exercise was undertaken by the Fisheries Extension Unit. Vessels which no longer existed and were no longer engaged in the fishery were taken out of the database.

- Divers were often accused by fishers of deliberately damaging fish pots/traps found during dive expeditions and negatively impacting coral reefs.
- Researchers were accused by fishers of taking fish and coral reef samples, and thus, contributing to environmental degradation.
- Community members had conflicts with local hoteliers over access to beach areas for fishing activity (seining) and recreation.
- Fishers had conflicts with the tourism sector and management authorities over the location of a jetty in the Soufriere Bay to facilitate tourism-related traffic; this structure was seen as an obstruction to seining activity.
- Tourism related vessel operators were accused by fishers of interrupting fishing and damaging fishing gear by passing too close to fishing activity, or directly in the path of deployed fishing gear.
- There were problems of visitor harassment by disorganised water taxi operators offering services to visitors.
- There was evidence of indiscriminate anchorage on coral reefs by yachtsmen.
- Entry into fragile habitat areas by divers was unregulated.
- The decrease in nearshore fisheries and the general status of resources was becoming increasingly apparent.
- Uncoordinated and unauthorised marine scientific research was reported to occur.
- Degradation of coastal water quality was a problem, with direct ramifications for human health and the integrity of marine ecosystems.
- Degradation of coastal landscapes was becoming apparent.
- Solid waste accumulation (especially plastics) was a cause for concern.
- There was a general lack of awareness of, and appreciation for, the marine environment.

## 2.3 The Zones

As mentioned in Section 1, a collaborative and participatory process over an eighteen month period, among multiple stakeholders, led to the official establishment of the SMMA in July 1995. As a result of this process, an eleven kilometre-length area of coastline was apportioned into several zones, catering to various users and uses. The zones (Figure 3) are delineated below:

**Marine Reserves:** These areas are declared for the purpose of protecting the natural resources they contain. No extractive activity is allowed. Entry into a Reserve (for diving, snorkelling, or research) is by permit and for a fee.

**Fishing Priority Areas:** These areas are declared for the purpose of maintaining and sustaining fishing activities, which take precedence over any other use of the area.

**Multiple Use Areas:** Activities that may take place in these areas include fishing, diving, snorkelling and other recreational activities, under the guidance of existing regulations.

**Recreational Areas:** These are terrestrial (beaches) and marine (swimming and snorkelling) areas, which are reserved for public access and recreation. Public access must be maintained.

**Yacht Mooring Sites:** Specific areas are designated to facilitate pleasure boats and yachts, without damaging bottom substrate, such as coral reefs and seagrass beds. A coral conservation fee is charged for the use of the moorings.



Source: SMMA Website, 2006

Figure 3: Zoning Map of the SMMA

### 3. ...SINCE THE CREATION OF THE SMMA

#### 3.1 The Achievements

From the foregoing, it is apparent that there was an urgent need to address the problems and conflicts in the coastal zone of Soufriere. The initiative, leading to the establishment of the SMMA, was clearly triggered by escalating conflicts among users of the nearshore coastal and marine environment, increasing evidence of resource degradation, and loss of economic, scientific and recreational opportunity in the marine sector (SRDF, 1994 b; SMMA, 1998). Since the SMMA was formed, and through the combined efforts of resource users, management authorities, scientists, non-governmental groups, donor organisations and the Soufriere community, there have been numerous achievements, summarised as follows (George, 1996; Brown, 1997; Renard, 1998; Pierre, 1999; Salm *et al.*, 2000; Sandersen and Koester, 2000; Pierre-Nathoniél, 2003, 2006):

- Reduction or resolution of conflicts among users, through a consultative and participatory process, leading to the enhanced co-existence of users in a shared coastal zone, and increased commitment to conservation, sustainable use and improved access and benefit sharing from the use of resources.
- Improvement in communication between various user groups and among user groups, researchers<sup>2</sup>, and management agencies; this has led to an increased understanding and acceptance of each other's part in the process.
- Improvement in the status of coral reefs, especially branching coral (Roberts *et al.*, 1997), which had previously been subjected to physical damage, particularly from anchorage.
- Increase in fish stocks in marine reserves and fishing priority areas (Roberts *et al.*, 1997), and as a reflection of these, there has also been an increase in fishers' catches (Gell *et al.*, 2001).
- Collaborative management of the area, through the formation of a multi-sectoral, multi-disciplinary, Technical Advisory Committee (see Section 3.2), comprising government organisations, non-governmental organisations, community members and resource users; this has helped to increase ownership for the SMMA initiative, through the direct involvement of resource users in management and has provided the forum for open and continuous dialogue. A few years ago, these institutional arrangements have further evolved, which will be discussed in Section 7.
- Increased awareness about environmental issues, especially as they relate to the marine environment, through the efforts of governmental and non-governmental groups and the

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<sup>2</sup> A research plan has been developed for the SMMA, to ensure: that research activities which are authorised, are beneficial to, and desired by, the SMMA; that research is conducted according to rules and regulations; that a technology transfer component is activated for all research conducted, especially by external groups; that local personnel are actively involved in research, especially in cases involving external groups; that all results, including subsequent writings are made available for approval prior to publication, etc.

media, including the involvement in, and sensitisation of, fishers on the work of researchers<sup>3</sup>.

- Provision of a valuable area for scientific study for researchers, because of the active management of use in marine reserves and fishing priority areas (controls and reliable data); and due to the uniqueness of the process leading to the establishment of the SMMA; this has also led to the acquirement of knowledge about the resources and other aspects of the area.
- Provision of facilities such as yacht moorings, which have facilitated the reduction in physical damage to marine habitats and the patronising of local businesses (e.g. restaurants) by visitors.
- Support in community activities and projects: for example, sponsorship of a local basketball team and carnival band depicting the marine environment; assistance in the celebration of fishermen's feast; provision of facilities for fishers, and grants (see Section 5.6) for marine related activities that are consistent with the objectives of the SMMA.
- Capacity building and facilitated organisation of previously disorganised water taxi operators into the Soufriere Water Taxi Association<sup>4</sup>, which has contributed towards a more viable business and helped to reduce visitor harassment by service providers in the area.
- Generation of user fees, which has essentially led to self-sufficient financing<sup>5</sup> of the SMMA; all normal administrative costs and routine operational costs are met directly by the SMMA; funds generated go into a special SMMA account and not into the government consolidated fund.
- Increased recognition, popularity, and pride: for example, the SMMA has been internationally recognised for its conservation efforts, including the 1997 British Airways Tourism for Tomorrow IUCN Special Award for National Parks and Protected Areas; and a position in the top five along with Algeria, USA, Spain and Canada for the 1997 World Underwater Confederation (CMAS) International Marine Environmental Award (GPIEM.) 1997; this has generated pride in the community and has facilitated the placement of Soufriere on the 'world map'; the well-visited SMMA Website has also contributed to the popularity of the SMMA and Soufriere as a whole, as well as activities such as the Caribbean Fun Cup Regatta for yachts, which the SMMA has facilitated; the SMMA has also been popular as a model and 'lessons learned' case study<sup>6</sup> at the local, regional (Caribbean region) and international levels; in fact, in recent publications on marine protected areas and coastal zone management, it is common to find reference being made to the SMMA.

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<sup>3</sup> The work of researchers is sometimes presented to fishers in an appropriate format and language (Creole) for ease of comprehension; however, this should be a regular occurrence. A few fishers have provided their vessels and seamanship skills for research (for a fee), especially for research over prolonged periods.

<sup>4</sup> This body is now called the Soufriere Water Craft Association.

<sup>5</sup> The SMMA is financed through user fees (diving, snorkelling, yacht mooring (coral conservation fee)), souvenir sales, grants (individual and organisational) and provision of services (such as mooring installation) to other islands. A 'friends of the SMMA' membership programme has also been initiated, as well as an 'SMMA Advocate' yachting programme.

<sup>6</sup> For example, the SMMA was selected as a demonstration site by the International Coral Reef Action Network (ICRAN) in 2001 (United Nations Environment Programme (UNEP/GEF).

- The establishment of a Customs office in Soufriere to assist with the declaration of visiting yachts and to facilitate the smooth passage of vessels through the SMMA.
- Powers of arrest granted to SMMA Rangers<sup>7</sup>, to enable them to more effectively carry out their duties.
- Positive comments made about the SMMA by the users themselves, especially fishers, who initially lost the most, in terms of prime fishing grounds, when the SMMA was established.

### **3.2 The Technical Advisory Committee**

The Technical Advisory Committee (TAC)<sup>8</sup> was an important functional unit of the SMMA. This body met regularly each quarter, and more often if needed, since the inception of the SMMA and its work evolved to include:

- Examination of progress made;
- Presentation and discussion of solutions to problems encountered (mechanism for feed-back);
- Approval of work plans and budgets;
- Enhancement of awareness;
- Consensus-building;
- Provision of direction for management (advisory role).

The members included: The Department of Fisheries; Soufriere Regional Development Foundation; Saint Lucia Air and Sea Ports Authority; Soufriere Fishermen's Cooperative; Ministry of Planning; Ministry of Tourism; Parks and Beaches Commission<sup>9</sup>; Saint Lucia Tourist Board; Marine Police Unit (coast guard); yachting representative; Customs Department; Saint Lucia Dive Association; Soufriere Water Taxi Association; two large hotel operations; two small hoteliers/ restaurateur representatives; the Saint Lucia Charter Boat Association; and the Saint Lucia Hotel and Tourism Association (SMMA, 1998). Representatives of the Saint Lucia National Trust, Ministry of Community Development, the Attorney General's Chambers and the Caribbean Natural Resources Institute, and representatives of funding agencies, research students and scientists also attended TAC meetings on occasion.

The structure and operation of the TAC indicated the importance of involving resource users in management, as they have the biggest stake in the sustainability and an intimate knowledge of the resources (Dahl, 1997; Rivera and Newkirk, 1997). Furthermore, the membership and operation pointed towards co-management as a user-group-centred-approach, but without neglecting or compromising the role of government in resource use management (Sanderson and Koester, 2000). Indeed, the benefits of partnerships in natural resource management, as in the case of the SMMA, should not be understated. For progress to be made in natural resource management, there must be community empowerment at the local level (Olsen and Christie,

<sup>7</sup> Not all the SMMA Rangers have powers of arrest conferred upon them.

<sup>8</sup> The TAC has now become the Stakeholder Committee (SC) under the new SMMA regime (see Section 7).

<sup>9</sup> This body has developed into what is now known as the National Conservation Authority.



2000). Increased participation and empowerment lead to an increased sense of ownership and the broadening of the base of information and knowledge, which is critical to effective decision-making and sustainability. Given monitoring and enforcement constraints, the latter are important for the promotion of regulatory legitimacy and compliance (Jentoft and Sandersen, 1996, cited in Sandersen and Koester, 2000).

Notwithstanding the merits of the TAC as a viable structure that encouraged participation and collaboration, the structure did not always function as it should---an issue that will be discussed in the following section (Section 4).

## 4. A CONSTANTLY ERUPTING VOLCANO

Despite the many successes of the SMMA, there have been several ‘knots’, some of which became evident in the early stages of operation (Brown, 1997; Pierre, 1997; Sanderson and Koester, 2000; Pierre-Nathoniël, 2003, 2006).

Fishers reported that they were experiencing declined fish catches and they blamed the SMMA for promises of increases. While it was unrealistic to expect significant results of increased fish stocks in fishing priority areas within a few years of establishing marine reserves (‘spill-over’ effect<sup>10</sup>), and notwithstanding the habitat destruction and high sedimentation in the Soufriere coastal zone from unnaturally heavy rain in 1995 and 1996, the disillusionment of the fishers cannot be understated. This situation was augmented by the feelings of fishers that the ‘rich’, predominantly white tourists that visit the SMMA, and the tourist service operators, were the only parties benefiting from the SMMA arrangement. In the fishers’ view, their livelihoods were being compromised.

Participation and collaboration, which form the heart of the SMMA, began malfunctioning.

Decisions began to be made by small groups of people outside the TAC. This included, for example, the negotiation by small groups for:

- The extension of a fishing priority area, which led to encroachment on a marine reserve<sup>11</sup>;
- The access by select fishers to specific sections of two marine reserve areas<sup>12</sup>;
- The sharing of a part of a fishing priority area with yachtsmen<sup>13</sup>.

All three decisions were made without the joint negotiation and consensus of the original agreement and in spite of the fact that such actions would affect other parties. Fishers began to infringe upon SMMA regulations by placing fishing gear in marine reserve areas.

Fishers also tended to fish directly outside the seaward marker<sup>14</sup> of marine reserves. Though effort was made initially to control the situation, attempts to intervene by the police were soon aborted, due to the reluctance of the Department of Fisheries and the SMMA to confiscate

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<sup>10</sup> The ‘spill-over’ effect refers to the export of organisms from marine reserves into fishing grounds.

<sup>11</sup> This marine reserve area is a very popular dive site. The cliff face at this site was used as a setting for the film ‘Superman 2’, where superman was filmed flying down the cliff face just above the water.

<sup>12</sup> This action was in recognition that the concerns of fishers were real, and with the intent that older, displaced fishers, with unwillingness or limited abilities to take up alternative livelihoods or engage in deep-sea fishing would be acknowledged for their loss. Four pots/traps were tagged for each of twelve pot/trap fishers, and one bottom gillnet for each of three gillnet fishers, with the intention of review after three months of trial. However, the selection process was not fair or accurate and heavy criticism led to the withdrawal of permits.

<sup>13</sup> Fishing priority and yacht mooring areas are separate zones in the SMMA and the SMMA is a no-anchorage zone. The sharing arrangement mentioned involves a fishing priority area, used especially by seine fishers, which is located adjacent to waterfront restaurants. A mutually beneficial roster arrangement for dual use was made between fishers and yachtsmen to facilitate fishing activity at certain hours, while at the same time, allowing yachtsmen to patronise local restaurants (through anchorage in the sandy area).

<sup>14</sup> The steep slope of Soufriere’s submarine shelf limits the distance from shore that demarcation buoys can be installed. To avoid decompression sickness, the buoys can only be attached in water to a depth of about eighty feet. However, the reef expanse and in effect, the marine reserves, extend beyond the point of the marker seen at the surface of the water. This still presents problems with enforcement.

fishers' gear<sup>15</sup>, brought on by the *seeming* political support that fishers *appeared* to have from their parliamentary representative. The ability to enforce SMMA regulations was also made worse by:

- The limited resources (vessels and manpower) of the Marine Police and the Department of Fisheries;
- The distance of travel required to get to the SMMA<sup>16</sup>, by which time the offenders would no longer be on site;
- The lack of powers of arrest by SMMA Rangers<sup>17</sup>.

In spite of the fact that there had been cases where the gear of divers and yachtsmen had been confiscated and fines had been charged, fishers complained that management and regulatory bodies gave preferential treatment to the former. While recognising the importance of effective enforcement in coastal zone management, it must be noted that voluntary compliance to regulations often gives better results, as compared with the 'big stick' (enforced compliance) approach.

Divers responded to fishers' behaviour by beginning, once again, to destroy fishing gear in an attempt to set fish free. This raised old animosities between the two groups and the credibility and legitimacy of the SMMA was weakened. This lack of cooperation also manifested itself with yachtsmen, who began to dishonour previous arrangements between themselves and fishers for the shared use of marine space.

The problems in the SMMA were amplified by four events:

- The closure, in 1996, of a local factory;
- This was followed by the closure of a major hotel<sup>18</sup>;
- The establishment of a new government;
- Economic restructuring, brought about by uncertainty in the banana industry, a prime income earner for Saint Lucia<sup>19</sup>.

Saint Lucia has responded to the problems in the agricultural sector by increasing the focus on tourism. Given that tourism, in the opinion of Soufriere fishers, has only led to self-sacrifice and

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<sup>15</sup> Under the Fisheries Act No. 10 of 1984, fishers' 'illegal' fishing activities are treated as offences rather than as crime.

<sup>16</sup> There is no Marine Police Unit (coast guard) or Department of Fisheries in Soufriere. In addition, the Soufriere District Police have traditionally (though wrongly) left all marine related enforcement to the Marine Unit based in the city of Castries (to the north), located about thirty to forty minutes by boat from Soufriere. Recently, a Marine Police Unit was established in the town of Vieux-Fort (to the south), located about forty-five to sixty minutes by boat from Soufriere (see Figure 2).

<sup>17</sup> Until the "new" SMMA Agreement came into being (Section 7), SMMA Rangers were intentionally not given powers of arrest, as they were seen as a critical friendly link between the SMMA and resource users. The Rangers also live in the community.

<sup>18</sup> Both the Saint Lucia Coconut Growers Association and the Jalousie Hilton have since re-opened under new management, but the effects of their closure were significant at the time.

<sup>19</sup> A World Trade Organisation ruling has removed the preferential treatment regarding the protection on the UK market for Windward Island Bananas. This liberalisation of trading agreements has disrupted the industry, leading to a drop in the value of banana exports.

loss, the economic restructuring of the country to this end, is not likely to be viewed optimistically by this group, at least not until significant benefits to them become apparent.

As regards the closure of the two establishments, many people were suddenly out of jobs and fishing became the readily available means for earning an income. The increase in fishing activity led to the resurgence of old conflicts of competition for use of limited space and resources. Robbery-related crime, especially on yachts, became rampant and increasingly violent. In no time, the word was out that Soufriere was a place to be bypassed by yachtsmen. This may well have contributed to the non-cooperative attitude of yachtsmen mentioned earlier.

The new government administration was formed in 1997. The overwhelming majority win, especially after decades of leadership under one party, encouraged fishers to advocate for change on all matters perceived to be of the old administration. Considering the growing disillusionment with the SMMA, it was included among the list of required changes. The new government, personified, in the case of the SMMA, as the Soufriere parliamentary representative, became directly involved in the SMMA. Fishers began to openly disregard SMMA regulations, *claiming* that they had received the support and approval of their representative to do so. There was increasing pressure to re-visit the zones of the SMMA and open some marine reserve areas (previously prime fishing areas). Despite the fact that the SMMA manager received direction for major decisions from the TAC, he was directly blamed for many of the problems in the SMMA and was subjected to constant threats<sup>20</sup>.

There has been the occasional resurgence of old problems and some problems have been new and short-lived<sup>21</sup>. In many cases, problems have been promptly and effectively addressed. In at least one case, external influences<sup>22</sup> have prompted the resolution of conflicts at the national level. Some newly emerging, or already existing problems have not been effectively addressed. Two of the more troubling issues, which have been barely dealt with since inception of the SMMA, due to the inability of the SMMA to unilaterally address them effectively are:

- High sedimentation rates into the nearshore, resulting from run-off from the land and via rivers<sup>23</sup>; this continues to degrade coral reefs within the SMMA, especially during storms and heavy rains;

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<sup>20</sup> One fisher filed charges against the SMMA manager (and subsequently, the SMMA and the Department of Fisheries) for the confiscation, and in the opinion of the fisher, maltreatment, of his gear found in a marine reserve.

<sup>21</sup> One example of an old problem that has occasionally re-surfaced includes seining activity on beaches adjacent to hotels, where hotel personnel complain that beaches are left in an unkempt state following fishing activity. Fishers have often responded positively to requests for cooperation. It is important to note that seining, being dependent on migratory pelagics, is not a scheduled activity.

<sup>22</sup> Shortly after the new government administration came into being and there was advocacy for change by the fishers and rampant violations of the rules and regulation in the SMMA, the SMMA became the recipient of the 1997 British Airways Tourism for Tomorrow IUCN Special Award for National Parks and Protected Areas. This facilitated the viewing of the SMMA in a new light, not only by the political directorate, but by the public at large.

<sup>23</sup> Sedimentation has contributed to problems with algal blooms and coral bleaching (Roberts, *et al.*, 1997). A few watershed projects have been initiated, but not at the level that will allow for significant results. The SMMA Rangers and the Caribbean Natural Resources Institute, in collaboration with the Department of Fisheries, conduct ongoing monitoring for sedimentation. A more integral and holistic approach, involving a multitude of key organisations and management authorities is required to address the issue of sedimentation. Furthermore, stringent measures need to be stipulated by the Development Control Authority (DCA) for: new developments, regular

- Enhanced algal growth in some areas, due to enrichment of the water, likely caused by improper sewage disposal<sup>24</sup>, with direct ramifications for human health and the integrity of marine ecosystems. The release of grey water into drains, rather than being directed into waste collection systems (e.g. septic tanks) is still a problem.

Other issues, of which some action has been initiated, but which are still in need of address in a comprehensive way include:

- Solid waste accumulation as a result of poor disposal practices<sup>25</sup>, which contribute to coastal degradation;
- Disregard of the authority of SMMA Rangers by certain yacht/dive personnel and the unauthorised use of marine reserves by the same on weekends and holidays<sup>26</sup>;
- Inadequate consultation with the SMMA regarding physical development in the coastal area of Soufriere, even though such decisions may affect the operations of the SMMA; or lack of action once reports have been made of illegal/unapproved physical development<sup>27</sup>;
- The delay in payment of fees by certain dive operators<sup>28</sup>, threatening the ability of the SMMA to operate effectively;

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monitoring by DCA and its referral agencies during and following approved developments and stiff penalties in the event of breaches.

<sup>24</sup> There has been some investigation by health authorities, but the problems have still not been adequately addressed. It is worth noting that water quality sampling stations were set up in the SMMA in 2004 (faecal coliform and *Enterococci*) as part of a broader monitoring programme between the Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries and the Ministry of Health. The SMMA also purchased some water quality monitoring equipment and improved the scope of its sampling in a Watershed Management project under the auspices of the Organisation of Eastern Caribbean States/Environment and Sustainable Development Unit (OECS/ESDU) and the National Oceanic Atmospheric Administration (NOAA).

<sup>25</sup> Island-wide sensitisation and action regarding solid waste is an ongoing programme of the Saint Lucia Solid Waste Management Authority (SLSWMA), an entity established in 1996, and this has also been the focus of some projects, notably, the USAID Environmental and Coastal Resources (ENCORE) Project. Activities of ENCORE were focused on the west coast of the island. It is worth noting that under the SLSWMA, a revised Solid Waste Management Act is expected to be enacted shortly. Saint Lucia is also taking steps to facilitate the establishment of a Returnable Containers Act (recycling), and a Marine Pollution Act, with a focus on ship-generated waste. In addition, the possibility of collecting garbage from yachts that use the SMMA, is also currently being discussed.

<sup>26</sup> By rotating the SMMA Rangers to allow for seven-day week surveillance and with the decision to allow Rangers powers of arrest, this problem is now more effectively addressed.

<sup>27</sup> The Development Control Authority has not always consulted with the SMMA prior to granting approval for development activity in the area. There have also been cases of unauthorised activity by individuals (such as building of walls and huts). With the new structure of the SMMA, the development of Physical Development Planning legislation with mandatory Environmental Impact Assessments (Section 7), and the membership of the SMMA on the Technical Sub-Committee of the Piton Management Area (World Heritage Site), which advises the Development Control Authority on developments in the area, the situation has improved.

<sup>28</sup> The SMMA was supposed to operate on a pre-payment fee-system for all-inclusive hotels; supposed cash flow problems of hotels have not always allowed for this system to work; permit books are provided 'up-front' to dive operators, with payment to be collected at a later date. Perhaps there is a need to offer discounts for early or timely payments and penalties for late payments. The SMMA needs to devise ways to make operators feel that their contribution is important to the SMMA; and that the SMMA is also important to operators' own livelihood, as lack of regulation in the area being administered, will ultimately lead to the demise of the very resources on which these operators depend. The Rangers also need to display more vigilance and stringency when requesting ticket stubs

- The grounding, on a few occasions, of vessels not familiar with the nearshore bathymetry of Soufriere<sup>29</sup>, which contributes to degradation of nearshore habitats/ecosystems;
- The mass ‘dumping’ of tourists in the nearshore for snorkelling and other activities and on beaches adjacent to hotels, coupled with traffic congestion, as vessel personnel await guests<sup>30</sup>; this is a safety hazard and can also contribute to resource degradation;
- Overuse of certain dive sites (congestion)<sup>31</sup>, to the detriment of corals and other marine life in these areas;
- The non-cooperation of the District Police in marine matters and the lack of a Marine Police base (coast guard) in Soufriere<sup>32</sup>;
- The problem of theft on yachts<sup>33</sup>, which can deter other yachtsmen and visitors from coming to the SMMA and can compromise the operations of the SMMA;
- Non-compliance with rules and regulations of the SMMA, especially by fishers from communities adjacent to Soufriere<sup>34</sup>.

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from boat operators for verification. Note, however, that with a qualified Accountant on staff, collection of monies owed has improved.

<sup>29</sup> Vessels have been fined for neglecting the rules of conduct regarding safe distances. Efforts to sensitise through the wide distribution of the SMMA brochure and flyers; the inclusion of guidelines in the SMMA website, discussions with the Saint Lucia Air and Sea Ports Authority, etc. are ongoing.

<sup>30</sup> This is not only a threat to the fragile marine environment, but there are also issues of safety, and the ruining of the ‘tranquil and pristine image’ paid for by guests from the hotels. The large number of persons on one of the reefs considered by many (though not necessarily so), to be in best condition, is a source of concern. Some short-term action has been taken to address this issue, and longer-term solutions are being discussed. In addition, draft Water-Based Tourism Standards have been developed for Saint Lucia and should be established shortly.

<sup>31</sup> Dive operators, in collaboration with the Saint Lucia Tourist Board, need to come together to devise ways to better advertise other sites in the SMMA and beyond, so that visitors will not continually request that they dive at the sites that they have heard most about. Novel or inexperienced divers should not be allowed in these ‘overused’ areas.

<sup>32</sup> While the need for a Marine Police base in Soufriere has been identified, limited resources have not yet allowed this to be realised. Efforts are being made to obtain more cooperation from the District Police, whose limitations include lack of a vessel. The SMMA has indicated its willingness to share its vessel with the Police, with the assistance a boat captain from the SMMA staff. There is more willingness in recent times on the part of the police, but issues such as police demeanour, unintentional intimidation of users of the SMMA and staff and the weaponry displayed on-person, still need to be ironed out.

<sup>33</sup> A more effective surveillance system is required. This has been the subject of discussion of a Sub-committee of the SMMA on enforcement. The Marine Industry Association of Saint Lucia (MIASL) which promotes the marine industry, has also been focusing its efforts largely on the yachting sector, especially in relation to safety. This Association has a 24 hour help hotline and has provided some assistance to the Police. The SMMA is part of this Association and has also received some assistance, such as the set-up of the SMMA’s improved VHS radio system at the District Police Station. Other assistance is planned. Overall, the public needs to feel more comfortable and secure in reporting persons known to be committing these crimes. This requires more professional behaviour being exhibited by law enforcement personnel. Once caught, stiffer penalties need to be applied to offenders. While there has been some improvement in the involvement of the District Police in theft and other criminal activity in the SMMA, much more cooperation is required. The Rangers also need to be further trained in the handling of cases, offenders, evidence, etc.

<sup>34</sup> Public awareness/sensitisation efforts need to focus beyond the immediate Soufriere community. This has already begun.

- The failure of one hotel to remove its yachts from a marine reserve area, encouraging non-compliance by other users was a problem for many years, since the inception of the SMMA. This dive resort has traditionally moored its yachts in the area under consideration. However, with the establishment of the SMMA, it was agreed that a jetty would be constructed in an already identified area, so that the vessels could be removed from the marine reserve area. This is a sensitive issue with fishers and dive operators. In 2002, an agreement to construct the jetty was signed between the SMMA and the owner of the dive resort. The jetty is currently being constructed and notwithstanding logistical problems being experienced, should be completed by 2007<sup>35</sup>.

The root causes for many of the foregoing problems are discussed further in Section 6.

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<sup>35</sup> Given the long delay in the construction of this jetty, the project site has undergone substantial recovery and now contains some thriving coral reef communities. Steps are being taken to conserve this area through the enforcement of a no-anchoring policy in the area.

## 5. EASING THE SOCIO-ECONOMIC PAINS: THE DISPLACED FISHERS

Until there is *significant* benefit to Soufriere fishers from enhanced fish stock status in marine reserve areas, and consequent ‘spill over’ to fishing priority areas, fishers will likely continue to be the group of stakeholders most negatively impacted on by the setting up of the SMMA. However, a ‘turn around’ has begun, given the results of fish stock monitoring in the SMMA. A comparison of data collected from the inception of the SMMA to early 2001, revealed that fish stocks have not only doubled and tripled in fishing and non-fishing areas respectively, but that these are now beginning to be reflected in the catches of fishers (Gell *et al*, 2001).

The Government of Saint Lucia, through the Department of Fisheries and the SMMA, and with assistance from donor organisations<sup>36</sup>, embarked on several initiatives in the Soufriere area (Pierre, 2000; Sanderson and Koester, 2000; Pierre-Nathoniél, 2003, 2006):

- In recognition of the fact that many of the socio-economic problems faced by Soufriere fishers were largely promulgated by the loss of prime fishing grounds;
- In an effort to help reduce fishing pressure on the nearshore resources.

### 5.1 A Temporary Stipend for Traditional Fishers

Through Cabinet Conclusion 783 of November 1997, the Government of Saint Lucia (GOSL) granted a monthly stipend of \$400<sup>37</sup> to twenty displaced fishers for a period of one year, to partially compensate them for the loss of fishing access to previously fished areas. The fishers selected were identified by the Department of Fisheries and the SMMA as being senior (age-wise) bonafide fishers, with a heavy dependence on pot/trap fishing. The project was aimed at persons with limited capabilities or willingness to engage in alternative livelihood activity, or deep-sea fishing<sup>38</sup>. Based on information obtained from fishers regarding revenue derived from pot/trap fishing, the above monthly stipend was considered to be reasonable.

In addition to the good intent behind the compensation fund, it was felt that this action would discourage fishers from engaging in unlawful fishing activities in the marine reserves, and there were conditions<sup>39</sup> to the stipend to facilitate this end. It was also the intention that the GOSL, and other relevant agencies, would seek to find or create alternative opportunities for non-fishers who had lost their jobs due to the closure of the factory and hotel mentioned previously. No

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<sup>36</sup> Donors that have provided financial assistance to the SMMA from inception to the present-time include, *inter alia*: the USAID Environment and Coastal Resources (ENCORE) Project; the Caribbean Conservation Association (CCA); the French Government, through its French Mission for Cooperation; the United Nations Environment Programme/Caribbean Environmental Programme (UNEP/CEP); Saint Lucia's National Commission for UNESCO; the International Coral Reef Action Network (ICRAN); the Organisation of Eastern Caribbean States/Environment and Sustainable Development Unit (OECS/ESDU), in collaboration with the National Oceanic Atmospheric Administration (NOAA); the Saint Lucia Air and Sea Ports Authority (SLASPA) and individual donors. In some cases, assistance from organisations/individuals also include non-monetary means.

<sup>37</sup> \$400 (Eastern Caribbean currency) is approximately \$US 150.

<sup>38</sup> Deep-sea fishing is much more demanding than nearshore fishing with respect to cost, time, skills and endurance.

<sup>39</sup> Conditions were centred on fines, termination of the stipend and confiscation of gear found in marine reserve areas.



significant effort was made in this regard, but fortunately, both facilities re-opened, thus alleviating much pressure on the nearshore resources.

It is important to note that monetary compensation of this sort, by its very nature, is problematic. It sets a poor precedence in coastal management, which is already being observed to a small extent in the SMMA. For example, fishers now approach the SMMA or the Department of Fisheries for monetary compensation for incidents resulting from natural occurrences, such as lost fishing gear, as a direct consequence of strong water currents, or for financial assistance in personal activities bearing no relationship with the SMMA, the marine environment, or the Soufriere community.

## **5.2 Select Access Granted to the Grand Caille Marine Reserve**

In recognition of the valid concerns of fishers, the idea of giving select fishers access to at least one marine reserve area was re-visited. It had also been expressed that pot/trap and bottom gillnet fishers had not been given adequate consideration in the zoning of the SMMA<sup>40</sup>. While recognising that even low levels of fishing activity could compromise the integrity of the marine reserves, restricted access to one marine reserve area was granted via Cabinet Conclusion No. 947 of December 1997<sup>41</sup>. As a result of the destructive nature of bottom gillnets<sup>42</sup>, the latter were not to be used in the said area.

## **5.3 Gillnet Buy-back Scheme**

Discussions with Soufriere fishers revealed that the majority agreed that gillnets accounted for much of the damage to coral reefs in the SMMA. Thus, a joint decision was made to prohibit their use within the SMMA. Nineteen existing gillnets were purchased from fishers<sup>43</sup> and effective August 1998, the use of bottom gillnets was prohibited within the SMMA. It was hoped that funds from the sale of these gillnets would be used by fishers for investment in gear

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<sup>40</sup> Pot/trap or bottom-gillnet fishing involve the deployment of gear on bottom substrate (e.g. coral reef) in order to catch demersals. The richest coral reef areas are not generally found in fishing priority areas, but rather, in marine reserve areas. Seine fishing targets pelagics, and, as such, a sandy bottom is desired for hauling in a catch, so as to avoid the tearing of the nets.

<sup>41</sup> While the number of persons fishing in this area is low, the fishing intensity appears to be high. There are also problems with the loss of labelled pots (many pots have had to be re-built and thus are no longer labelled) and the transfer of fishing rights from the initial senior displaced fishers to younger family members (the intention was non-transferability).

<sup>42</sup> The majority of the fishers in Soufriere agree that bottom gillnets are very destructive to coral reefs, as the nets get caught on to coral reef areas when hauled, resulting in pieces of coral reef being ripped off. A subsequent decision between fishers and the Ministry of Agriculture, Forestry, and Fisheries, through its Department of Fisheries, banned the use of gillnets throughout the SMMA, effective August 1998.

<sup>43</sup> Fishers who engage in bottom-gillnet fishing are also involved in other types of fishing, such as pot/trap or deep-sea fishing. One fisher opted not to participate in the programme, as much of his fishing uses gillnets. The individual had subsequently been involved in much illegal fishing activity in the SMMA. This had been a sore point with other more cooperative fishers. Since then, peer pressure from other fishers and cautions and confiscation of gear by management authorities had led this individual agreeing to participate in the programme. Unfortunately, at this point, funds had run out. This fisher had since then sued the SMMA and the Department of Fisheries for the confiscation, and in the opinion of the fisher, maltreatment, of his gear found in a marine reserve. The SMMA has since then tried to accommodate the individual by agreeing to purchase his gillnets to remove them from the system. However, the individual was uncooperative as he was dissatisfied with the amount being offered. To date, he has not continued to fish illegally in the SMMA and it is possible that he has sold his gillnets to fishers in other communities where bottom gillnets are allowed.

for deep-sea fishing, but no attempt was made to monitor the use of these funds. It was also recognised that focus on deep-sea fishing was unsuitable for older fishers, due to the time, costs, skills and labour-intensiveness required.

## **5.4 Establishment of Fisheries Facilities**

Access to ice is a significant problem facing fishers island-wide, where catches can be unpredictably large and facilities to store fish are not available. This handicap causes unnecessary wastage and loss of income to fishers, due to poor prices during glut periods. Upon the request of the fishers of Soufriere, an ice machine was purchased in 1998, which facilitated the temporary storage of fish. The machine was maintained by the Soufriere Fishermen's Cooperative. It was also intended that such a facility would become an asset for dealing with bumper catches from the highly seasonal offshore pelagic fishery, in the event that this became a focus for some of the vessels. The ice machine incurred severe damage as a result of storm activity in 1999.

In addition, also in 1998, a fish market was completed with donor assistance. The intent was to provide fishers with a clean, healthy and central area to sell fish. While there was some reluctance<sup>44</sup> on the part of many fishers to use the facility, interventions from the political directorate<sup>45</sup> encouraged the use of the facility. The facility was destroyed by storm activity in 1999.

However, the Government of Saint Lucia, with the technical and financial assistance of Japan, established a new Soufriere fisheries facility in 2003. This facility comprises an administrative building, an ice making plant with a capacity of just less than 1 ton per day, and a storage capacity of 1.5 tons. Also included in this facility is a workshop area to allow for boat engine repairs, gear lockers for fishermen, washroom facilities, a fuel station, and a new fish market.

Upon the request of the fishers, the construction of a jetty was also completed in 1998 near a gasoline station in Soufriere, in order to facilitate direct fuelling by fishers prior to fishing expeditions. The jetty also facilitated off-loading following fishing trips, due to its location in close proximity to the fish market. The jetty was destroyed by storm activity in 1999. With the re-location of the gasoline station and the establishment of new fisheries facilities in an improved location as mentioned above, there was no need to re-construct this jetty.

## **5.5 Introduction of Fish Aggregating Devices**

In a continued effort to enhance fish catches and, in particular, to encourage west coast fishers to divert their efforts to offshore fishing,

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<sup>44</sup> Some fishers felt that the facility was inappropriately located. However, the reluctance stemmed mostly from the fact that Soufriere fishers traditionally sell fish in manually driven carts around the town, or spots chosen on the waterfront or near the roadside---a static location meant that competition with each other for sale of fish would be greater. It also meant that persons wishing to purchase fish now had to go to the fish market to do so, rather than being served at their convenience. Fishers also felt that there was inadequate consultation on an appropriate location for the jetty.

<sup>45</sup> The interventions of the parliamentary representative from Soufriere (who is now on the Board of Directors of the SMMA) were significant in encouraging the use of the facility.

Fish Aggregating Devices (FADs) were built and deployed off the west coast of the island, including Soufriere<sup>46</sup>.

FADs are designed to act as fixed shelters for migrating pelagic fish. Small fish are known to congregate around FADs in search of food and shelter and larger predatory fish are then attracted to the FADs, thus reducing the time and cost of hunting for fish offshore. These structures have been supportive in encouraging traditional nearshore fishers to engage in offshore fishing and have also provided a viable fishing site during the second half of the year when the migratory pelagics are scarce and fishing effort has tended to focus on nearshore demersal fish.

## **5.6 An Investment Fund**

This fund was activated in 1998/1999 to assist fishers in obtaining loans for engaging in activities other than coastal demersal fishing (e.g., deep sea fishing activity, alternative livelihoods such as tourism-related activities). Under the project, fishers were provided with a grant comprising twenty percent of the funds required for an investment, with the total amount of the grant not exceeding \$6000<sup>47</sup>. A number of fishers submitted projects for this form of assistance and while there was a long delay in funds becoming accessible, there was some success, although significantly smaller than expected<sup>48</sup>. One success story involves a fisher-family who was able to access funding to purchase a boat-engine and two freezers to facilitate the storage and sale of fish to hotels and restaurants. This small retail business has undergone some expansion and is now a registered company which purchases fish, lobster and conch from the neighbouring island of Saint Vincent for sale in Saint Lucia.

## **5.7 Longline Training**

Longline projects<sup>49</sup> aimed at encouraging deep-sea fishing have been devised and implemented in Soufriere. This is in an effort to provide the opportunity for fishers to learn to construct and operate tuna longlines. This type of project is:

- To encourage investment in deep-sea fishing by newcomers to the fishing sector;
- To reduce the pressure on nearshore resources;
- Ideally suited to young fishers with the willingness and ability to engage in deep-sea fishing, as a viable means of earning a living.

Sample gear for this type of fishing was made available to interested fishers. Of course, it is clear that investment in this type of fishing requires funding and a few fishers have used the

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<sup>46</sup> Initial deployment of FADs in Soufriere was unsuccessful---individuals from outside the community reportedly stole some of the materials used to construct the first device. Awareness exercises, which were subsequently conducted prior to deployment of additional FADs, would have been useful in avoiding such vandalism. There have also been reports of vessels in transit causing unintentional damage to FADs. The need for the structures to be monitored and promptly repaired has been discussed and discussions have also ensued to include them on nautical charts. The Soufriere Fishermen's Cooperative is expected to take responsibility for the maintenance of FADs in Soufriere. However, in the future, the SMMA may assume this responsibility.

<sup>47</sup> \$ 6000 (Eastern Caribbean currency) is approximately \$US 2,200.

<sup>48</sup> The long delays in the receipt of funds contributed to the loss of interest in the fund by fishers.

<sup>49</sup> There was a short-term project over a few months, as well as an ongoing project with a time frame of two years. The Department of Fisheries, through its annual fishers training programme, has also focused some of its training in longline fishing techniques.

investment fund mentioned previously to purchase new engines to facilitate this activity. One longline vessel was registered for the Soufriere area in 2005 (DOF Data Management Section, 2006).

## 6. GETTING TO THE CRUX OF THE MATTER

The problems in the SMMA have been numerous and continuous. For progress to be made, the root causes of such problems must be identified, analysed and addressed. Root causes are categorised below, although there may be some overlap (Brown, 1997; CANARI, 1998; SMMA, 1998; Salm *et al*, 2000; Sandersen and Koester, 2000; Pierre-Nathoniél, 2003, 2006).

### 6.1 The Lack of a Comprehensive Plan

- There is still no connection between the SMMA and a national development plan for Saint Lucia (see Figure 4 for an example of a comprehensive Municipal master plan). There have been efforts at integration through:
  - The promotion of the concept of Island Systems Management<sup>50</sup> by the Organisation of Eastern Caribbean States/Natural Resources Management Unit<sup>51</sup>;
  - The development of initiatives such as the National Environmental Action Plan (GOSL, 1997) and the National Biodiversity Strategy and Action Plan (NBSAP) (GOSL, 2000).

In spite of these and other more recent initiatives (Section 7.2), no true comprehensive development and management plan exists for the island. This makes the issue of *ad hoc* development more rampant.

Of course, it is recognised that achieving the development and more importantly, the effective implementation of a comprehensive national development plan, as depicted in Figure 4, is difficult. As such, smaller plans (components of a comprehensive plan) are often developed, such as the NBSAP mentioned above. However, Saint Lucia still lacks a written overall national vision and goal for development that brings together important policies and plans, from which the SMMA can draw upon for more effective operation.

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<sup>50</sup> Island Systems Management is described as “a multi-disciplinary, multi-sectoral, multifaceted mechanism, aimed at rationalising the use of island resources and the achievement of the goals of sustainable development” (Nichols and Chase, 1995). The special character (small size, topography, social and cultural uniqueness, etc.) of small islands and the need for a management regime that reflects this character, was highlighted in the Rio Declaration on Environment and Development and Agenda 21 (UNCED, 1992). For example, the cohesiveness often found in small island communities lends itself to participatory forms of management; the heavy reliance on coastal resources for livelihoods makes socio-economic considerations of utmost importance; and, a small action in an island (destructive or enhancing) can have a big effect. Small islands influence their coastal and marine environments and vice versa in a much shorter time frame as compared with larger landmasses. As such, in accordance with the concept of Islands Systems Management, the entire island landmass and its juridical marine area constitute the coastal area of small islands.

<sup>51</sup> This entity is now referred to as the Organisation of Eastern Caribbean States/Environment and Sustainable Development Unit (OECS/ESDU).

1. A statement of objectives, principles, assumptions, policies, and standards on which the constituent proposals for the physical, economic, and social development of the municipality are based
2. **A land use plan element taking into account topography, soil conditions, water supply, drainage, floodplain areas, marshes and woodlands**
3. A housing plan element including, but not limited too, residential standards for the construction and improvement of housing
4. A circulation plan element showing the location and types of facilities for all modes of transportation
5. A utility services plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment and solid waste disposal
6. A community facilities plan element showing existing and proposed location and type of educational or cultural facilities, historic sites, libraries, hospitals, firehouses, and police stations
7. A recreation plan element showing a comprehensive system of areas and public sites for recreation
8. **A conservation plan element that provides for the preservation, conservation and utilization of natural resources, including energy, open space, water supply, forests, soil, marshes, wetlands, harbors, rivers and other waters, fisheries, endangered or threatened species of wildlife and other resources, and that systematically analyzes the impact of each other component and element of the master plan on the present and future preservation, conservation, and utilization of those resources**
9. An economic plan element
10. A historic preservation plan element
11. A recycling plan element
12. An element indicating the relationship of the master plan to the master plan of contiguous municipalities, the master plan of the county in which the municipality is located, and any state master plan

**Note:** Elements 2 and 8 will be the building blocks for establishing an ecologically based system of land use.

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*Source: Taken from NJSA 40:55 D-1 et seq.*

**Figure 4: Minimum Contents of a Comprehensive Municipal Master Plan**

## **6.2 No Shared Vision...No Clear Mission**

- Neither the original “Agreement” to manage the SMMA, which was approved in principle by the Cabinet of Ministers in November 1995 (SRDF, 1994 b), nor the draft “Management Plan” (SRDF, 1994 a), indicated the purpose and goals of the SMMA. Furthermore, the purpose and goals had never even been defined by consensus. This lack of a shared vision is likely to have contributed substantially to the disagreements and misunderstandings that have occurred among stakeholders.
- The draft “Management Plan” has never been completed, neither is it used regularly as a management tool. In fact, it was not a true management plan as it lacked many of the main components of such a plan, such vision, mission and objectives, which are necessary for providing clear direction.

## **6.3 Inadequate Legal/Enforcement Regime**

- The Fisheries Act and Cabinet Conclusions did not provide an adequate legislative basis for management and regulation of the SMMA, given the diverse interests represented.
- The Agreement was meant to address conflicts through the zoning of uses. However, it was not binding upon the parties involved. The presence of tourism officials on the TAC, for example, did not make their involvement in the SMMA mandatory.
- There was no clear or effective enforcement regime for the SMMA and the support from the police was inadequate.

## **6.4 Institutional/Collaborative/Representation Deficiencies**

- Lack of autonomy of the SMMA as a body, often led to *ad hoc* decisions being made outside its structure.
- The TAC, as a forum for discussion, feedback, advice, awareness-enhancement, approval and consensus-building, became too large, making decision-making a very cumbersome and delaying process.
- There had been domination on the TAC by certain groups. The seeming power struggle between the Soufriere Regional Development Foundation and the Department of Fisheries in the early years of operation, highlight the difficulties of ‘power sharing’ in collaborative management endeavours. In addition, while dominant personalities have been instrumental in many of the achievements of the SMMA, the lead-type characters of certain individuals have also been a fundamental part of some of the unclear management responsibility problems experienced by the SMMA.
- During the initial years of the SMMA, the roles of lead agencies such as the Department of Fisheries and the Soufriere Regional Development Foundation were unclear. In addition, the part played by the many other organisations on the TAC had been indistinct, and there were

conflicts resulting from poor understanding of roles and responsibilities of resources users, researchers and management authorities.

- There had been problems stemming from improper representation, such as in cases where decisions agreed to by fisher representatives on the TAC, did not account for the interests of all fisher groups. The lack of involvement of the District Police on the TAC from the initial stages, may have contributed to their lack of ownership for the process and their lack of support in enforcement. While the problem of becoming too broad must be recognised, invitation of selected representatives to meetings may not be the best depiction of true participation. Representation problems have also arisen through the inadequate consideration of certain user groups during the zoning process.
- Sub-Committee/Working Group-‘burnout’ led to lack of follow-up on important issues. Many of the same individuals were often on multiple task forces with numerous meetings to attend.

## **6.5 Resource Limitations**

- Inadequate resources, both financial and human, contributed to inefficiencies in the SMMA.

## **6.6 Political Issues**

- The *seeming* political affiliation of the Soufriere Regional Development Foundation in the early years of operation had caused problems of distrust in the community.
- The direct involvement of the parliamentary representative of Soufriere in the SMMA is viewed as a ‘mixed blessing’. The deficiencies in the policy framework have sometimes led stakeholder groups to turn to the political directorate for assistance in resolving conflicts, rather than relying on the SMMA Agreement system.

## **6.7 Cultural and Ethnic Differences**

- Despite the fact that the Department of Fisheries continues to stress that the prime function of marine reserves is for the protection of fish stocks for the benefit of fishers, and notwithstanding that fishers have come to understand and accept this function for the most part, the fishers’ perceptions that they have been marginalised to accommodate ‘rich, white tourists’ cannot be overlooked. In addition, the actions of dive leaders, relating to the release of fish found in illegally placed gear, may well have been spurred on by their clientele. In other words, the main interest of clientele would likely be the enjoyment and appreciation of the underwater world of the SMMA (‘conserve everything’ mentality), rather than having a keen interest in the livelihoods of fishers.



## **6.8 Accountability, Indicators, and Evaluation**

- A number of groups have been affected by the SMMA, both negatively and positively, to differing extents. However, no process existed to weigh and balance these against environmental, social and economic impacts in order to encourage the development of creative management strategies.
- The lack of an established system for the review and revision of the Agreement had encouraged *ad hoc* proposals and adjustments of this Agreement.

## **6.9 Communication/Sensitisation/Participation**

- While there has been enhanced information flow and sensitisation since the establishment of the SMMA, breakdown in communication from time to time has caused serious problems of conflict and non-cooperation. The non-involvement of all stakeholders in decision-making in some cases has weakened the credibility and legitimacy of the SMMA. It is difficult to keep the interest of all stakeholders all the time, and some people tend to participate only when they believe that their interests are being compromised. In addition, the SMMA's public outreach activities are not sufficiently extended outside the Soufriere community.

## 7. THE SMMA IS GOING PLACES

### 7.1 Improving Partnerships through Formalisation

To begin to address some of the aforementioned issues, the TAC requested a review of the SMMA in July 1997, with the official process beginning in November 1997. This was a very intense consultative and participatory process. The first phase involved the review of the strengths and weaknesses of the SMMA, with recommendations made for improved management. The second phase resulted in the formulation of a structure that was deemed to be more efficient and effective. The Cabinet of Ministers granted approval for the new revitalised structure for the SMMA, via Cabinet Conclusion 1648 of 1999, which includes:

- The declaration of the existing eleven kilometre-length Soufriere Marine Management Area as a Local Fisheries Management Area under the Fisheries Act No. 10 of 1984;
- The establishment of the management body of the Soufriere Marine Management Area as a Local Fisheries Management Authority for the purpose of the management of this Local Fisheries Management Area;
- The formation of a Not-for Profit Company under the 1996 Companies Act of Saint Lucia, to be referred to as the Soufriere Marine Management Association.

Under the new Agreement, an eleven-member Board of Directors was established (Figure 5). The 'Agreement to Manage the SMMA' (SMMA, 1999 a) was officially signed by the partners in January 2001 and a president "with proven knowledge and experience in the field of development and management" (SMMA 1999 b) was appointed for a renewable period of two years. The new structure, with its associated Agreement and Bylaw, *inter alia*:

- Provides a clear vision and purpose;
- Gives the SMMA a stronger legal basis;
- Provides the SMMA with more autonomy;
- Clearly defines the roles of all contractual parties;
- Elucidates a process for review and evaluation;
- Is binding upon all partners;
- Improves the partnership between the public and private sectors through formal agreement and clearer role sharing.

The TAC has remained the forum for input and discussion by all stakeholders, but not the ultimate decision-making body, for which it was largely ineffective. This body, under the new structure, is referred to as the Stakeholder Committee (SC). It is worth noting that the parliamentary representative for Soufriere is part of the Board of Directors. While some view this as an avenue for political intervention, it may well function to the benefit of the SMMA, by providing political support for the SMMA.

While the "new SMMA" (Figure 5) is by no means the solution to all problems, it is certainly a **BIG** step in the right direction. Under this new arrangement, the SMMA now has a clear mission.

The ultimate aim of the SMMA is **“to contribute to national and local development, particularly in the fisheries and tourism sectors, through the management of the Soufriere coastal zone, based on the principles of sustainable use, co-operation among resource users, institutional collaboration, active and enlightened local participation, and equitable sharing of benefits and responsibilities among stakeholders”** (SMMA, 1999 a).

### **New Institutional Arrangements**

- The management of the area is governed by a new Agreement, which was negotiated among the members of the TAC, and which defines the vision, mission, objectives, regulations, zoning, programmes and institutional arrangements of the SMMA. The Agreement was officially signed by the partners in January 2001. A formal review of the Agreement and its implementation is carried out once every two years from the date of signing of the Agreement.
- The SMMA remains the portion of the coast between Anse l'Ivrogne in the south and Anse Jambon in the north, from the shore to a depth of seventy-five meters. The original zoning and regulations have been maintained.
- The Soufriere Marine Management Area is a Local Fisheries Management Area and the organisation is a Local Fisheries Management Authority under the Fisheries Act No. 10 of 1984.
- The organisation is made a Not-for-Profit Company under the Company's Act of 1996, called the Soufriere Marine Management Association. The Association holds an Annual General Meeting.
- The Board of Directors (BODs) of the Association consists of organisations with recognised management functions relating to the SMMA. The Board meets at least once per quarter. The members consist of public and private partners, governmental and non-governmental organisations and comprise the following:
  - Ministry with responsibility for Fisheries;
  - Ministry with responsibility Planning;
  - Ministry with responsibility Tourism;
  - Saint Lucia Air and Sea Ports Authority;
  - The National Conservation Authority;
  - The Saint Lucia Dive Association;
  - Saint Lucia Hotel and Tourism Association;
  - Soufriere Fishermen's Cooperative;
  - Soufriere Regional Development Foundation;
  - Soufriere Water Taxi Association);
  - Parliamentary representative for Soufriere.
- One person with proven knowledge and experience in the field of development and management, appointed by the Cabinet of Ministers, upon the recommendation of the Minister of Agriculture, Forestry and Fisheries for renewable periods of two years, serves as President.
- The TAC has evolved into the Stakeholder Committee (SC), and includes a broad membership to ensure representation of all stakeholders. All major proposals for management and development produced or being considered by the management agencies of the Association, and related to the SMMA, must be presented to the SC for advice. Issues raised by the SC must be considered by the BODs of the SMMA. The SC meets at least once per quarter.
- Agencies on the BODs retain individual management authority for areas and sectors under their jurisdiction.

**Figure 5: The New Institutional Arrangements for the Operation of the SMMA**

## **7.2 Towards the Strengthening of the Association**

While support received from established connections is still limited, the SMMA has begun to increase its sphere of influence. Many of the organisations involved in new environmental initiatives are members of the Board of Directors or Stakeholder Committee of the SMMA. The SMMA staff members have also been directly involved in several of the activities. With these and other initiatives currently underway or completed, the relevant connections are being made, making the whole system more effective and efficient. Some relevant initiatives are outlined below:

### **7.21 Environmental Impact Assessment**

The revised Physical Planning and Development Act No. 29 of 2001 now includes Environmental Impact Assessment (EIAs) regimes. Under this Act, EIAs are mandatory for, *inter alia*, marinas; ports; development in wetlands, marine parks, national parks, conservation areas, other sensitive environmental areas; and coastal zone developments.

### **7.22 Coastal Zone Management Policy**

A “Coastal Zone Management (CZM) Policy, Guidelines and Selected Projects” was adopted by the Cabinet of Ministers in 2004. The CZM policy provides an institutional framework for CZM in Saint Lucia. In this regard, a Coastal Zone Management Unit (CZMU) has been established under the Sustainable Development and Environment Section of the Ministry of Physical Development Environment and Housing. This Unit is supported by a multi-agency Coastal Zone Management Advisory Committee (CZMAC), which facilitates the ecosystems approach to CZM. The CZMU is currently working on the development of the Coastal Zone Management Strategy and Action Plan.

### **7.23 Water Policy**

To address issues facing the water sector, the Government of Saint Lucia embarked on a process aimed at producing a policy and strategy to guide the sustainable use and development of the island’s freshwater resources. Such a policy is a critical aspect of CZM in Saint Lucia, especially given the fact that freshwater systems are often the vehicle of much of the island’s land based marine pollution. The National Water Policy for Saint Lucia was formally adopted by the Cabinet of Ministers in 2004. This policy not only enunciates the Government’s policy as it relates to the water sector and the island’s freshwater resources, but also provides strategic actions to facilitate implementation of the policy, including institutional arrangements to be implemented.

### **7.24 Piton Management Area-World Heritage Site**

A Pitons Management Area (PMA, which includes part of the SMMA) has been established as an Environmental Protection Area (EPA) under the Physical Development Plan Act of 2001. In addition, the PMA, including its terrestrial and marine components was declared a World Heritage Site in 2004. The SMMA is a member of the Technical Sub-Committee of the Piton Management Area Advisory Committee (PMAAC), which provides advice to the Development Control Authority on development projects in the area.

### **7.25 National Environmental Policy and National Environmental Management Strategy**

A review of institutions, policies and legislation was carried out in 2002 as well as an

environmental policy review in 2004, under the auspices of the Ministry of Physical Development Environment and Housing.. These reviews aimed to develop a more effective and holistic institutional and legislative structure to address environmental issues. This led to the development of a National Environmental Policy and National Environmental Management Strategy (NEP/NEMS), which was adopted by the Cabinet of Ministers in 2005. The National Environment Policy provides the broad framework for environmental management in Saint Lucia, and establishes links with policies and programmes in all relevant sectors of economic and social development. The National Environmental Management Strategy aims to provide the specific directions and mechanisms for more effective policy implementation and includes specific results expected and actions necessary to realise the policy objectives. This policy also speaks to the issue of land-based sources of marine pollution.

## **7.26 SMMA Communications Plan**

The Communications Plan of the SMMA continues to be implemented through the efforts of its staff, including a Public Relations Officer and through the work programmes of other agencies on the Board of Directors and Stakeholder Committee (e.g. the Department of Fisheries).

Several communication activities have transpired over years, but financial constraints have impeded the full implementation of the Communications Plan of the SMMA. In this regard, certain key sectors remain insufficiently mobilised to adequately support the objectives of the SMMA and fully comply with its rules and regulations. These include representatives of user groups (fishermen, yacht charter and dive operators), relevant government agencies (District and Marine Police) and the general public.

However, considerable progress has been made in establishing a balance between enforcement of rules and regulations and public relations. This includes, *inter alia*:

- Production of a newsletter;
- Establishment of a website on the SMMA;
- Hiring of a full-time Public Relations Officer;
- Hiring of a full time qualified Accountant<sup>52</sup> ;
- Establishment of a Customs base<sup>53</sup> in Soufriere, housed within the office of the SMMA;
- Production of eight televised video documentaries<sup>54</sup> and eleven public service announcements<sup>55</sup>.
- Revitalisation efforts by the SMMA, focused on “Anbaglo”, that is, Saint Lucia’s Dive Association<sup>56</sup> ,

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<sup>52</sup> This facilitates communication linkages with users/operators on financial matters.

<sup>53</sup> This facilitates communication linkages on immigration matters for yachters and others.

<sup>54</sup> These documentaries include: Soil Erosion and the Impact on the Coral Reefs; Rescue the Reef -Share the Bounty; Protecting the Future; Marine Reserves Do Work; Stakeholders’ Comments on Marine Reserves; Mooring Installation; Small Activities Big Impact; The SMMA Ten Years Later (in progress).

<sup>55</sup> Public Service Announcements include the following themes: About the SMMA; Plastics; Littering; Visitor Harassment; Water/Sedimentation; Coral Reefs; Marine Reserves and Fishers; Rangers/Enforcement; Rules and Regulations; User Fees; and Wastewater/Algae.

<sup>56</sup> This body (including the SMMA) is in the process of facilitating efforts to obtain a hyperbaric oxygen chamber for the island.

and the Soufriere Water Craft Association<sup>57</sup>, both of which sit on the Board of Directors of the SMMA;

- Membership of the SMMA on multiple national committees and mailing groups; and,
- Other outreach activities (e.g. engagement of schools in specific activities such as essay competitions and exhibitions; involvement of the SMMA in televised panel discussions; participation of the SMMA in, and holding of community meetings on topical issues (e.g. safety and security; improving the business community in Soufriere;)); conduct of presentations at hotels, schools and other national, regional and international fora).

Indeed, effective communication between stakeholders, community groups and other involved parties remains critical. The implementation of the Communications Plan thus remains a high priority for the SMMA.

Other relevant initiatives, which are underway, but have not yet been completed include:

#### **7.27 Land Use Policy**

The issue of land-based sources of pollution impacting negatively on nearshore resources is difficult for the SMMA to address in isolation, especially in the absence of a comprehensive land use plan for the island. In an effort to begin to address land issues, a National Land Committee was established. This has led to the preparation of the Green Paper on a National Land Policy. The Green Paper provided the basis for new round of consultations and development of a National Land Policy: White Paper. The White Paper, which is to be submitted to the Cabinet of Ministers for endorsement, provides a formal statement of policy objectives and directions. It provides the mandate and the basis for a range of programmes, measures and actions aimed at improving and rationalising land use and management in the country, including the review and formulation of specific laws and regulations wherever necessary.

#### **7.28 Restructuring of Ministry with Responsibility for Physical Development**

There are plans to restructure the Ministry with responsibility for Physical Development, to strengthen its ability to effectively carry out its mandate, which includes environmental management.

#### **7.29 Marine Pollution Act**

A Marine Pollution Act is currently being drafted. It is expected to contain provisions for ship waste issues, thus giving effect to the International Maritime Organisation-related conventions to which Saint Lucia is party.

#### **7.30 Revised Fisheries Legislation and Management Plan**

The Fisheries Act No. 10 of 1984 and the Fisheries Regulations No. 9 of 1994 are currently being revised. They are expected to be enacted by 2007. The Soufriere Marine Management Association is a Local Fisheries Management Authority under the Fisheries Act for the Soufriere Marine Management Area, a Local Fisheries Management Area (LFMA). The Fisheries Management Plan of 2001-2005 has also being revised and should be adopted shortly.

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<sup>57</sup> This body was previously called the Soufriere Water Taxi Association.

### **7.31 Solid Waste Legislation**

The Solid Waste Management Act No. 20 of 1996 has been revised. A Returnable Containers Act has also been drafted. Both pieces of legislation are expected to be enacted shortly.

### **7.32 Water Resources Management Agency**

A Water Resources Management Agency (WRMA) is expected to be established shortly to replace the Water Resources Unit (WRU). The WRU was responsible for the development of the country's first Water Policy and played a significant role in the development of The Water and Sewerage Act of 2005. This piece of legislation provided the legal basis for the establishment of the WRMA. The new agency will assume the responsibilities of the WRU, including implementation of the Water and Sewerage Act, islandwide hydrometric monitoring and public awareness and education necessary for the long-term sustainable use of water resources.

### **7.33 Ratification of Protocol for Land Based Sources of Marine Pollution (LBSMP)**

Saint Lucia is currently seeking to ratify the LBSMP Protocol. The LBSMP Protocol identifies the major sources of land-based pollution and offers ways for decreasing their negative impacts on the coastal and marine environment.

### **7.34 OECS Protected Area and Associated Livelihoods (OPAAL) Project**

The OPAAL Project is a development plan that seeks to conserve biodiversity of global importance in the participating countries<sup>58</sup> of the Organisation of Eastern Caribbean States (OECS), by removing barriers to the effective management of protected areas, and through increased involvement of civil society and the private sector in the planning management and sustainable use of such areas. The fifteen year project has an ultimate goal of creating an integrated system of protected areas among the OECS member States, which will protect and conserve ecologically-sustainable, representative samples of the region's rich biodiversity, while creating sustainable livelihoods for communities in and around the protected areas. The project recognises that people are an essential component of the planet's ecosystem and therefore must be integrally involved and accommodated in the processes of biodiversity conservation. The OECS Secretariat is responsible for the implementation of the project.

It is worth noting that in reference to the six demonstration sites of the project, Saint Lucia's site, the Pointe Sable Management Area, received official endorsement by the Cabinet of Ministers in October 2006. Under the Saint Lucia component of the OPAAL project, a revision process for Saint Lucia's System of Protected Areas is also underway.

### **7.35 Water-Based Tourism Standards**

Draft National Water-based Tourism Standards have been developed by the Saint Lucia Bureau of Standards, in collaboration with the Ministry of Tourism and other relevant agencies. This is to be submitted to the Cabinet of Ministers shortly.

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<sup>58</sup> The Organisation of Eastern Caribbean member States (OECS) that are part of this project include: Antigua and Barbuda, Dominica, Grenada, Saint Kitts, Saint Lucia and Saint Vincent and the Grenadines.



### 7.36 Recreational Water Quality Standards

Standards for Recreational Water Quality are currently being developed by the Saint Lucia Bureau of Standards, in collaboration with the Ministry of Health, Ministry of Agriculture, Forestry and Fisheries and other relevant agencies. Upon completion, this will be submitted to the Cabinet of Ministers for endorsement.

### 7.37 SMMA Research and Monitoring Programme

A Research and Monitoring Framework (SMMA, 2001) has been developed for the SMMA, with the following objectives:

- To guide the involvement of students and researchers in research activities within the SMMA;
- To enhance the availability and use of information and knowledge relevant to management;
- To document and analyse the experience of the SMMA.

The purpose of the framework is:

- To improve decision-making in support of adaptive management;
- To increase efficiency and coordination of research and monitoring activities;
- To increase cost-effectiveness of research and monitoring investments; and
- To develop research and monitoring protocols based on 'best practice'.

The SMMA has several research and monitoring initiatives, some of which have been completed, but others are underway or ongoing:

- **Coral Reef Monitoring**-The Reef Check Methodology for monitoring of coral reefs began in the SMMA in 1999. This monitoring continues under the auspices of the Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries, but has been broadened to include other sites on the island.

In addition, the Caribbean Natural Resources Institute monitors the growth and mortality of coral reefs in the SMMA on a semi annually basis, through the use of photo quadrats.

- **Water Quality Monitoring**-A joint water quality monitoring programme began in 2002 by the Ministry of Health and the Ministry of Agriculture, Forestry and Fisheries. Monitoring sites have been selected based on their implications for both human and nearshore habitat health and include sites within the SMMA. Samples are collected at stations in Soufriere by the SMMA staff. While this programme is not islandwide in terms of coverage, it monitors bacterial parameters (namely faecal coliforms and *Enterococci*) at a number of sample points along the north, west and south-west coasts.

In addition, a National Oceanic Atmospheric Administration (NOAA)-funded Watershed Management Project implemented through the Organisation of Eastern Caribbean States/Environment and Sustainable Development Unit (OECS-ESDU), is almost completed. The project had multiple components for "Promoting Watershed Management in the Wider Caribbean Region by Lessons Learnt from the Soufriere Watershed Management Area".

Under this project, the SMMA has been able to expand its water quality monitoring programme and purchase some relevant equipment for the same.

Further, the SMMA conducts regular monitoring of sedimentation, water clarity and water salinity.

- **Nutrient Monitoring**-A Nutrient Monitoring Project under the National Coral Reef Initiative (NACRI), includes a Saint Lucia-SMMA component which is being implemented by the SMMA. This is a NOAA funded initiative. This new type of coral reef monitoring for Saint Lucia will link the condition of the reefs more directly to the effects of island watershed and land-based sources of pollution. This will eventually result in data sets linking nutrient levels and their origins to algae and coral cover for three islands (Saint Lucia, Bonaire, Curacao) with varying degrees of tourism development, all in the southern and south-eastern part of the Caribbean, and all with highly developed coral reefs.

A few noteworthy projects that investigated, *inter alia*, the role of marine reserves in reef fishery sustainability have been conducted in the SMMA. These are outlined below:

- A study entitled ‘Soufriere Experiment in Reef Fisheries Sustainability’ (SERFS) was a cooperative research venture by the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP)<sup>59</sup>/Dalhousie University, Nova Scotia, Canada, McGill University, Canada and University of the West Indies, Barbados. As part of the SERFS, experiments were undertaken to test the mechanisms by which marine reserves export post settlement (adult) fishes to adjacent non-reserve areas (Hatcher, *et al*, 1995). In 1995 and 1996, this team collected baseline data of fish movement in the SMMA and conducted studies using visual tagging methodologies (Coreless *et al*, 1996).

In related studies by the SERFS team, the nature and pattern of reef fishing were described, and the effect of the establishment of the SMMA on catches of reef fishers (and incomes) was quantified by comparative measurements before and after zoning (Goodridge *et al*, 1996). Other studies by the SERFS team have focused on the reproductive output of major reef species within the SMMA in order to establish a baseline against which to assess the effectiveness of the marine reserves in exporting fish larvae.

Further studies have been conducted by the team on how mean displacement (movement) would change as density within the SMMA increased and involved the introduction of acoustic transmitters in an attempt to accurately measure the export of two commercially important fish species found in the SMMA (Eristhee and Oxenford, 2001).

- Reef fish stock assessments have been carried out by a scientific team led by Dr. Callum Roberts from the University of York, England. Dr. Roberts monitored fish stocks annually from 1994 to January 2001 in reserves and fishing areas (Roberts *et al*, 1995, 1997; Gell *et al*, 2001).

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<sup>59</sup> This body has evolved into the Caribbean Regional Fisheries Mechanism (CRFM).

Additionally, Dr. Roberts' team examined the impact of sediment pollution from the Soufriere river on both coral and reef fish communities, as well as the spread of coral diseases at the Anse Chastanet and Grand Caille reefs (Nugues, 1998).

This same team also compared the results of fish stock assessments to the catches of fishermen (Gell *et al*, 2001). The team worked in collaboration with the Department of Fisheries, which monitors fish landings in Soufriere, as part of an islandwide monitoring and data management programme.

There are other examples of research that have been conducted in the SMMA by student researchers that are not outlined here.

## 8. SUMMARY AND CLOSING THOUGHTS

It is hoped that the details of Saint Lucia and the SMMA have been effective in demonstrating the dynamism inherent in coastal zone management and the efforts to employ the ecosystem approach to management. Steps have been taken to improve the effectiveness and efficiency of the SMMA. Many lessons have been learned through trial and error. The need for a supportive institutional and legal framework, to allow the SMMA to operate in a way consistent with a shared vision and clear mission, has been realised. The formation of a Board of Directors for management guidance and the continued presence of the stakeholder body, are two acknowledgements of the importance of balancing continued communication and participation with a strong institutional framework. The continued attendance of stakeholders to quarterly meetings of the TAC (now the Board of Directors) and the Stakeholder Committee, despite the problems, may well indicate an underlying commitment to make the system work. In addition, the involvement of the political directorate in the management of the SMMA is linked to the idea of 'who is at the table', and such a presence, coupled with the growing number of new and relevant environmental initiatives, have begun to provide the SMMA with the sphere of influence that it requires for success.

There is no 'quick fix' for the many deficiencies identified in this paper. There are barriers related, among others, to cultural and ethnicity differences, 'turf' and limited resources and capacity. However, management of any coastal zone is a dynamic, flexible, transitional and evolutionary process. It is indeed encouraging that there is already an enhanced awareness and understanding of the importance of the marine environment in Soufriere and an exemplary system for natural resource management, after about eleven years of operation, especially:

- Considering that the SMMA is still a relatively young institution;
- Recognising the socio-economic problems of resource users;
- Given that coastal zone management initiatives must be sustained for decades in order to obtain significant changes in societal behaviour and values.

There is still much to be done, including the need for the SMMA to become more proactive, anticipatory and accountable. This can be facilitated through the establishment of proper and reliable baselines, indicators and systems for evaluation. There is also a need for a more integral and holistic approach to coastal zone management in Saint Lucia, that is, a deliberate and marked attempt to consistently deploy the ecosystem approach to management, which will facilitate the more effective tackling of large problems affecting, not only the SMMA, but the island as whole.

There is no escaping from the fact that the SMMA will face further challenges in the future, including, but not limited to:

- The difficulties associated with assuming responsibility for the adjacent Canaries/Anse la Marine Management Area (CAMMA);
- The proposed new hotel development in the SMMA, which is to include a new marina;
- Increased traffic and other issues associated with the new Pitons World Heritage Site, with part of the SMMA being inclusive of the Site;

- Negative effects on coral reefs from sedimentation and wastewater, coupled with the compounding effects of storm events and global warming<sup>60</sup>.

Undeniably, the actions taken by Saint Lucia, the Soufriere community and the SMMA, the effects of natural occurrences and external influences, and by large, the embodiment (or not) of the ecosystems approach, will determine the future of coastal zone management for the area and for the island as a whole.

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<sup>60</sup> Coral bleaching has been observed in the SMMA in recent times.

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