Coastal Zone Management in Saint Lucia: Issues Paper

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Coastal Zone Management Project
Ministry of Agriculture, Forestry and Fisheries
Saint Lucia

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Prologue

This document was prepared as a working paper for a series of consultations aimed at developing a framework for coastal zone management in Saint Lucia. It outlines coastal zone management issues and forms part of the basis for the development of a Coastal Zone Management Policy for Saint Lucia. Notably, the policy is published as a separate document but is intricately linked with this report.

Abbreviations

CAMMA	-	Canaries/Anse la Raye Marine Management Area
CZM	-	Coastal Zone Management
CZMU	-	Coastal Zone Management Unit
GIS	-	Geographic Information System
NEMO	-	National Emergency Management Organisation
NRMU	-	Natural Resource Management Unit
NWCCP	-	North West Coastal Conservation Project
OECS	-	Organisation of Eastern Caribbean States
SMMA	-	Soufriere Marine Management Area

1. Issues and Trends

It is critical to note that although the following sections are presented separately, there are many cross cutting factors:

Natural Resources

Biodiversity

In spite of its small size, Saint Lucia contains diverse communities of plants and animals and some of these are found nowhere else in the world. However, a range of human activities threatens the island's biodiversity; for example, agricultural, commercial and residential developments are transforming natural habitats. Coastal and freshwater ecosystems are stressed by high levels of sediment loads and agrochemicals, and the disposal of raw and partially treated sewage.

To mark its commitment to conservation of its biodiversity, the Government of Saint Lucia ratified the international Convention on Biological Diversity in 1993. As a commitment under this agreement, Saint Lucia embarked on a national study, detailing the status and needs of the island's biodiversity. This study highlighted a number of harmful trends resulting from human activities, and these include:

- loss of key species (e.g. higher carnivorous reef fish species are disappearing from the food web)
- declining habitat diversity (e.g. dry scrub forest in coastal areas and wetland coverage are on the decline)
- loss of indigenous species (e.g. the Saint Lucia Muskrat is extinct)
- introduction of exotic species (e.g. Tilapia fish found in all fresh and brackish waters on the island and the Pink Mealy Bug which has degraded some plant species are not native to Saint Lucia)

In addition to the country study on biodiversity, Saint Lucia has prepared a ‘National Biodiversity Strategy and Action Plan’ which details policies and actions needed to protect and sustainably utilise the island's biodiversity. The successful implementation of this plan would positively impact on coastal zone management in Saint Lucia.

Water resources

There are seven major watersheds in Saint Lucia from which most of the island's water demand is met. Few investigations have been carried out to determine the availability and potential supply of ground water as a potable source.

Degradation of watersheds due to deforestation and clearing of lands for agriculture and other purposes continues to decrease the base flow of river systems. Heavy sedimentation and contamination by agro and other chemicals due to runoff from land or indiscriminate dumping are also taking their toll on the island's water supplies. Yet, as the population expands and development continues, the demand for water increases.

The lack of an effective management and planning system to ensure sustainable use of both private and public lands contributes to the complex nature of the aforementioned issues.

To address problems affecting both fresh and coastal water quality, the Water Resources Management Unit is currently undertaking a project entitled, “Integrating the Management of Watershed and Coastal Areas in Saint Lucia.” A part of this project entails developing and adopting policy regarding freshwater resources.

Forestry and landscape

Development, in the current environment of inadequate policy, legislation and institutional frameworks, has led to encroachment onto and indiscriminate clearing of forests and coastal landscapes. Private forested lands are particularly prone to deforestation as owners clear cut to accommodate farming, land subdivision for housing and other activities.

Notably, the maintenance of the island's forests is critical for a healthy supply of freshwater and equally important for good coastal water quality.

Air quality

While problems relating to air quality have not reached drastic proportions in the country, the tendency for this to become a reality exists as main roads are mostly concentrated in coastal areas, (given the rugged terrain of the island's interior) and traffic is at all time high. In response to this, the Sustainable Development and Environment Unit, Ministry of Planning has seen it fit to address the issue of air quality while it is still in its infancy. This agency continues to spearhead ventures which have led to the reduction of green house gas emissions and the use of ozone depleting substances on the island. The agency also embarked on a campaign that has led to the ban of leaded gas for vehicles on the island.

Sea level rise

The collection of sea level data for the island only commenced in 1998, and therefore, future sea level rise in Saint Lucia must be based on predictions from data recorded elsewhere. Notably, most recording stations around the world have indicated that the mean sea level rise has steadily increased over the past century. Sea level rise has negative implications for coastal/marine resources; for example, erosion of beaches and inundation of low-lying lands.

Further, due to its location, the island is exposed to storms that produce extreme wave and surge conditions. These conditions, alone or coupled with sea level rise, can have devastating impacts on coastal/marine resources. Consequently, there is need to ensure that appropriate contingency plans are in place, as well as mitigation measures such as setbacks from vulnerable areas. To date, the National Emergency Management Organisation (NEMO) has embarked on activities aimed at contingency planning, risk assessment and disaster preparedness; however, the coordination link between the NEMO and Ministry of Planning needs to be strengthened.

Productive sectors

Industry

Although Saint Lucia is not considered to be heavily industrialised, current trends show that existing industries are significantly contributing to pollution of the coastal zone and if left unaddressed, have the potential of becoming a major area of concern in the near future. For example, a report prepared by the Department of Fisheries in 1991 stated that an estimated 534,500 cubic meters of wastewater is discharged annually into coastal water from a variety of sources (a distillery, soft drink, dairy products, edible oil and margarine, soap, coconut meal and meat production operations). Interestingly, the Biodiversity Country Study Report of St Lucia (1998), states that these figures are likely to be very conservative. If left unmanaged, wastewater reaching the marine environment can have devastating impacts on marine systems.

Currently, there is a general move by industries towards compliance with trade and other international standards as they become forced to compete on the global market. Further, local industries are obligated to meet commitments under international agreements such as: International Convention for the Prevention of Pollution from Ships (1973/78); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1999); Convention for the Prevention of Marine Pollution by Dumping Wastes and Other Matter (1972); and Montreal Protocol on Substances that Deplete the Ozone Layer (1987) (see section on Environmental Standards).

Fishing

The Department of Fisheries has made substantial progress in the area of fisheries management: for example, the development and implementation of comprehensive fisheries legislation; development of a Fisheries Management Plan; and the establishment of Local Fisheries Management Authorities. Despite these efforts, overfishing of some species, destructive fishing practices, loss of fishing grounds to other conflicting uses, and degradation and loss of fishing, nursery and spawning grounds due to storms and land based pollution continue to present challenges for fisheries management authorities. Further, the enforcement of fisheries related laws by national law enforcement agencies is

given comparatively low priority in the current climate of increasing crime and limited manpower and other resources.

Tourism

Tourism is one of the world's largest economic enterprises and is often a major money earner for coastal nations. Falling into this category, Saint Lucia depends heavily on this industry. However, the promotion of the island as a 'sun, sand and sea' destination has led to conflicts between the tourism sector and other water-based activities, particularly fishing. Further, the industry is market driven, and the main aim of any market is to achieve economic growth in the short-term by encouraging an increase in profit: often taking the focus away from natural resource limits (natural carrying capacities) or the limits of acceptable change. Thus, the negative impacts of tourism often go unaddressed until they begin to affect the quality of the tourism product being promoted. In addition, the cruise ship sector is an extremely important sector, but the island is currently ill equipped to adequately deal with collection and disposal of cruise ship-generated waste.

To date, a number of measures have been put in place to alleviate conflicts among coastal resource users and ease the pressure of resource use: for instance, snorkelling and dive regulations have been created under the Fisheries Act; protected areas have been declared under the forestry and fisheries legislation; and zoning of some sections of the coastal area has been carried out (with the creation of marine management areas). In addition, the Saint Lucia Heritage Tourism Programme, which commenced in 1998, has been assigned the task of enhancing and strengthening Saint Lucia's community-based heritage tourism sector. As such, this programme promotes optimal economic returns from tourism within communities while ensuring minimal impact on the natural resources, thus generating long-term sustainable development of the sector.

Agriculture

Although the agricultural sector's contribution to the economic development of the country has declined over the past few years, it is still considered to be the mainstay of

the local economy. This decline is mainly due to an array of problems facing the banana industry that have resulted in reduced export and foreign exchange earnings.

The agricultural sector has contributed to coastal problems as highlighted below:

- Introduction of agrochemicals into waterways and coastal waters.
- Encouraged the loss of soil which has led to high levels of sediment in rivers and coastal waters.
- Degradation of coastal landscapes by removal of dry scrub forests.
- Contribution to solid waste problems in the form of pesticide containers and the blue diothene plastic bags used in the banana industry.

In addition, management authorities are forced to deal with problems that stem from private land ownership and it has proven difficult to ensure that farmers operating on private lands adhere to recommended agricultural and conservation practices.

Aquaculture

Aquaculture is currently being carried out on a relatively small scale and entails mariculture of a few species of marine algae (seamoss), and the culture of a hybrid Tilapia and one species of freshwater prawn in ponds. Despite the small scale, potential problems caused by aquaculture (such as aquaculture farms becoming a source of pollution and the introduction of harmful exotic species) need to be identified and examined to facilitate forward planning. Further, the Fisheries Act No. 10 of 1984 makes provision for the leasing of any land including areas of the foreshore and seabed for the purpose of carrying out aquaculture activities. This provision may have implications for public access to these public lands, and therefore this issue also needs close scrutiny.

Mining

Although there is a permit system in place for the mining of sand, easy access to this resource has led to illegal sandmining activities. Further, in the absence of stiff penalties and regular monitoring and enforcement, these illegal activities continue to degrade the island's shoreline. The relevant management authorities also give permission for persons

to mine sand in river mouths when sand bars have formed and disrupt the flow of rivers causing a potential for upstream flooding. This activity deprives beaches of an important source of sand, contributing to erosion of the island's beaches.

Mining of pumice, stone and other materials from land-based quarries contributes to degradation of river and nearshore systems as sediment from mined areas reach waterways via runoff during rainy periods.

Illegal mining of stones from rivers facilitates suspension of sediment in water and is thus another activity that has negative impacts on river systems and ultimately on nearshore habitats.

Although mining sand from offshore is not a common practice in Saint Lucia, when and where it does occur, there are implications for a change in wave dynamics due to bathymetric changes, in addition to a decline in water quality due to suspended particles. The OECS-NRMU is currently in the process of developing general policy guidelines regarding this issue and these will likely be adopted by member islands as needed.

Physical development

Built environment

Unplanned and uncontrolled settlements foster a wide range of problems. These types of settlements do not facilitate the establishment of appropriate facilities to cater to adequate sewage (including grey water) treatment, general waste disposal and setbacks. Further, such settlements, due to their ad hoc and unplanned development, are often vulnerable to events such as landslides, floods and storm surge impacts. A clear example reflecting these issues is the orientation of development in the north of the island, which has caused more than half the population to settle in this region. A major consequence of this highly built environment, along with its inadequate utilities to service the region, has been the severe degradation of supporting coastal systems such as coral reefs (which serve as natural wave breakers); mangroves and beaches (coastline protectors); wetlands

(protectors against flooding); seagrass beds (seabed sediment stabilisers); and rivers and watershed areas (the main source of potable water).

The lack of appropriate setbacks, along with inappropriately sited structures along the coastline and the degradation of natural wave breakers (fringing reef systems), often result in shoreline erosion. Consequently, this is followed by a need to invest already limited funds into shoreline protection works.

Poor drainage systems, coupled with inadequate solid waste disposal and appropriate setbacks from flood plains and riverbanks lead to flooding in low-lying areas during rainy periods.

Aside from the aforementioned issues, planning authorities, in many cases, are also overwhelmed by factors such as:

- limited flat lands to accommodate increasing developments – the consequence of Saint Lucia's rugged terrain;
- inadequate sewage treatment systems and other basic facilities to service the existing population - the result of a lack of forward planning; and
- clearing of lands to accommodate the ever expanding built environment – the result of urbanisation.

There is thus a desperate need to develop and implement systems that will promote effective forward planning and development control. To begin to address all these issues a planning institutional and legislative review was carried out (1998-2001), resulting in the Physical Planning and Development Act # 29 of 2001, along with draft Physical Planning Regulations and Environmental Impact Assessment Regulations. Various sections of the Physical Planning and Development Act will likely come into effect at different times in order to facilitate institutional changes needed to operationalise the new planning regulations. Complementing these relatively new legislation and institutional arrangements, is the development of a land use policy for the island. It is envisaged that this will lead to the development of a comprehensive land use plan for the island.

Ports and marinas

The development and operations of ports and marinas can have significant negative impacts on coastal/marine resources. For instance, the Rodney Bay Marina was created through the dredging and excavation of a wetland. Water circulation between the Rodney Bay and the lagoon of the marina is mostly due to wind driven circulation from offshore, and exchange driven by temperature differences through the one access channel at the northern end of the lagoon. General surface inputs consist of two small seasonal rivers and surface runoff from the surrounding area. However, these processes are not sufficient to allow for adequate water circulation between the bay and lagoon. Amplifying this problem is the fact that there are no facilities for collection or pump out of sewage from yachts at the marina or on anchorage. Studies carried out by the Ministry of Health (1989-1992) and during the North West Coastal Conservation Project (1993) revealed high faecal coliform concentrations in the lagoon. Other areas of concern are the Marigot Marina and the Castries Harbour.

Notably, the Physical Planning and Development Act # 9 of 2001, lists ports and marinas as types of development that require compulsory environmental impact assessments. However, there is a need to ensure that appropriate policy, legal and institutional arrangements are in place to address the issue of effective management of existing ports/marinas.

Pollution control and waste management

Pollutants and waste materials present severe problems in the coastal zone. Management authorities are faced with numerous issues stemming from non-point sources of pollution, such as controlling runoff from agricultural lands and urban areas. Runoff from the land contributes to high levels of sediment in rivers and coastal waters and the introduction of agrochemicals and industrial by-products into these systems. Further, runoff acts as a transport medium for improperly disposed solid waste which ultimately reaches water based systems. The improper disposal of raw and partially treated sewage in coastal

waters, and point source pollution such as wastewater from industries and spoils from construction sites are yet other issues in need of adequate address.

Notably, these issues have negative implications for nearshore fishery resources, river systems and ultimately human health and the water-based tourism sector.

Management systems

Environmental standards

Although there has been no formal adoption of national standards relating to the environment, the Standards Act # 4 of 1990 makes provisions to do so. If no standards exist for a particular process, product or the like, the relevant agency may request the Standards Bureau Committee through the Bureau of Standards to establish the guidelines of interest. In fulfilling this request, the Standards Bureau Committee may adopt existing international standards and adapt them to meet the national needs, or they may choose to develop and adopt new standards.

Currently, there is a move towards the adoption of some international standards by a few establishments. For example, the Hess Oil Company is now ISO 14000 certified; the Saint Lucia Heritage Tourism Programme has developed general guidelines for Emergency Management Systems to be adopted by local ecotour operators; and the Saint Lucia Fish Marketing Corporation is moving towards becoming HACCP (Hazard Analysis for Critical Control Points) certified. This trend is likely mirroring global market trends that are encouraging local industries to compete at an international scale. However, there is an urgent need to establish and enforce environmental standards regarding factors such as various effluent discharges and water quality (marine and fresh water).

Protected areas

In 1986, 1990 and 2000 a total of twenty-six (26) marine reserves were declared under the Fisheries Act, but very few have been actively managed. The main objective of creating these reserves is to conserve and protect areas such as turtle nesting sites and fish

nursery and breeding grounds. However, over the years, enforcement of laws governing marine reserves has proven to be a difficult task due to the remoteness of some of these areas, low enforcement capacity, the fact that some of the land-based reserves are privately owned and boundaries for most of these reserves have not been legally demarcated. Marine reserves within the SMMA, CAMMA, and the Maria Islands' Wildlife Sanctuary have the most comprehensive resource management system for protected areas in place in Saint Lucia. Other protected areas being under some degree of active management include forest reserves (total area of forest reserves is 7,500 hectares) and historic and cultural sites such as the Pigeon Island National Landmark; and marine reserves within the Fond D'Or and the Mankotè mangroves.

Interestingly, although the trend over the years has been to increase the number of protected areas, there are generally inadequate management and enforcement systems in place to ensure that these areas are serving their intended purpose.

Data collection and management

Insufficient priority is given to collection and management of relevant data, resulting in a severe lack of information regarding coastal processes in the local environment (e.g. wave data, current data, shoreline dynamics, etc.) to make informed planning and management decisions. Further, the use of Geographic Information Systems (GIS) has yet to be realised.

Scientific information is needed to guide the wise use of coastal resources, to protect the environment, and to improve the quality of life at a national scale. This need is becoming more evident as the complexity of the relationships among the environment, resources, and the economic and social well-being of people becomes fully recognised, and changes and long-term threats are discovered.

The sustainable development of small islands is often hampered by the lack of appropriate data collection and management systems. International declarations such as those of the United Nations Conference on Environment and Development advise that in

the absence of such information, the burden of proof should be on those wishing to develop or utilise a resource, to demonstrate that their proposed activity will not bring significant harm to the coastal area or resources within, and if such proof cannot be given, the proposed activities should not be carried out. However, currently, in the absence of adequate data, decisions are made that may have irreversible consequences and that threaten the resource base over the medium to long term.

There is thus a need to implement measures that will result in a change of attitude among management authorities and decision-makers about the importance of collection and management of data, as well as the importance of using these data to guide planning and management decisions. This change in attitudes should lead to support for the implementation of an appropriate data collection and management system to facilitate forward planning and development control within the coastal zone.

Further, unauthorized research activities in Saint Lucia's waters are also of concern. In many cases, information collected during such research is not made available to Saint Lucia, and therefore does not contribute to informed decision-making. To ensure that all research data are available to the relevant local authorities, the Minister with responsibility for fisheries and researcher enter into a formal agreement before any research is carried out. This agreement stipulates that researchers must provide the Department of Fisheries with a complete copy of the research papers produced.

Public awareness and education

Incorporation of general environmental issues into the formal education system has been slow, but ongoing. Currently, the School Based Assessment component of the CXC examinations allows for basic research of coastal issues by students. Also, schools have incorporated the subject of mangroves and coral reefs into their curriculum at the grades 5 and 6 levels. Further, a certificate in Environmental Management is currently being offered by the Continuing Education Department, Sir Arthur Lewis Community College.

However, there is a need to reach the wider public and bring general coastal zone management issues to the forefront. Often public education, awareness and sensitisation programmes are short term and target a narrow audience; but to succeed at effective management of resources within the coastal zone, such programmes need to be wide spread and long term, with an aim to alter people's perceptions of limitless natural resources and changing attitudes from one of 'living just for today' to one of 'ensuring sustainable livelihoods'.

Environmental law

There are numerous pieces of legislation dealing with planning and environmental issues; however, the establishment of these has been brought about through a reactive approach rather than a proactive one. Hence, the existing legislation does not assist in facilitating a coordinated approach to planning and development in an environmentally sustainable manner, and has led to overlaps and gaps in the system, which often create conflict and/or confusion over the precise jurisdiction of distinct agencies.

Saint Lucia is party to various international agreements that are supportive of coastal zone management issues. However, the responsibility for fulfilling obligations under these agreements is carried out by several different agencies. There are current initiatives aimed at taking a coordinated approach to the implementation of related agreements.

Saint Lucia maintains a 'dualist position' with respect to the link between national and international law. As such, although St Lucia is a party to a number of international agreements that have a direct bearing on coastal zone management issues, it is first necessary for these agreements to be incorporated into national law to facilitate enforcement within the national legal system. However, many relevant international conventions are yet to be incorporated into national law.

Special Area Management Planning

Over the years, a number of areas have been proposed for special management. Various pieces of legislation make this possible, namely the National Trust Act, Wildlife

Conservation Act (1980), Fisheries Act (1984), National Conservation Authority Act (1999), Physical Planning and Development Act (2001) and Land Conservation and Improvement Act (1992).

These proposals have resulted from efforts aimed at resolution of resource use conflict and/or conservation and protection of critical habitats and ecosystems. In fact, the Saint Lucia National Trust facilitated the development of a system of protected areas for the island in 1992 which is currently being reviewed. Although this system has not been adopted by the Government of Saint Lucia, some of the proposed areas of focus are being given consideration and these include the Grande Anse National Park, Praslin Protected Landscape and the Pointe Sable National Park, all located on the east coast of the island.

Establishment of other specially managed areas such as the Soufriere Marine Management Area and the Canaries/ Anse la Raye Marine Management Area has proven effective in conflict resolution and has also positively impacted on the health of nearshore resources.

The northwest coast, which is heavily impacted on by high populations and tourism related activities is an area that could benefit from special area management planning.

Although special area management can prove quite successful, this practice is currently threatened by a lack of coordination and synergy between management and planning authorities. For instance, development plans approved to take place within specially managed/protected areas or in close proximity may not necessarily be supportive of the management objectives of this area, and at times, the two may be in outright conflict.

2. Current framework for CZM in Saint Lucia

Institutional arrangements

Over the years, Saint Lucia has established numerous legislative instruments that address various aspects of CZM, and the responsibility for such management has been shared by a number of governmental, non-governmental and community-based bodies. However,

there is no accompanying comprehensive, coordinated institutional and legislative framework in Saint Lucia for CZM. Table 1 lists current line agencies with mandated CZM roles.

Table 1. Coastal zone management line agencies.

Agency	Responsibility and related legal mandate
Ministry responsible for agriculture, forestry and fisheries	Responsible for the development and management of agricultural, forestry and fishery resources. • Agricultural Small Tenancies Act (22/1983) • Fisheries Act (10/1984) • Fisheries Regulations (9/1994) • Fisheries (Snorkelling Licence) Regulations (223/2000) • Forest, Soil and Water Conservation Ordinance (25/1946) • Land Conservation and Improvement Act (10/1992) • Pesticides Control Act (7/1975) • Wildlife Protection Act (9/1980)
Ministry responsible communications, works, transport and public utilities (including Meteorological Office)	Responsible for maintaining a functional network of roads and other related infrastructure and systems. • Beach Protection Act 1967 (as amended by Act 9/1984) • Minerals (Vesting) Ordinance (7/1966)
Saint Lucia Air and Sea Ports Authority	Responsible for the operation of air and sea ports on the island. • Air and Sea Ports Authority Act (10/1983) (amended by Act 15/2000) • Sea Ports Regulations (92/1985) • Shipping Act (11/1994) (amended by Act 16/2000) • Yacht Licence Act 5/1971) • Merchant Shipping (Oil Pollution) Act (11/1996)
Ministry responsible for environmental health	Responsible for maintaining environmental health as it relates to public safety, including monitoring of coastal/marine water quality. • Public Health Act (8/1975) • Public Health (Sewage and Disposal of Sewage and

Agency	Responsibility and related legal mandate
Ministry responsible for environmental health (con'd)	Liquid Industrial Waste Works) Regulations (22/1978) • Public Health (Water Quality Control) Regulations (14/1978)
Ministry responsible for planning and environment	Responsible for ensuring sustainable use of all publicly- and privately-owned land in the interest of the public; maintaining and improving the quality of the physical environment; and protecting and conserving the natural and cultural heritage of the island. • Crown Lands Ordinance Cap. 108 • Physical Planning Act (29/2001) • Special Development Areas Act (2/1998)
Ministry responsible for tourism (including National Conservation Authority)	Responsible for development and management of the tourism industry. • Hotel Aids Ordinance Act (25/1959) • National Conservation Authority Act (16/1999) • Tourism Incentives Act (7/1996) • Tourism Industry Development Board Ordinance (4/1981) (as amended by Act 6/1993)
National Emergency Management Office	Responsible for mitigation of, preparedness for, coordinating responses to, and recovery from emergencies and disasters. • Disaster Preparedness and Response Act (13/2000) • Emergency Powers (Disasters) Act (5/1995)
Saint Lucia National Trust	Responsible for the conservation and preservation of natural cultural heritage of Saint Lucia. • Saint Lucia National Trust Act (16/1975)
National Water and Sewerage Commission	Responsible for the operation and regulation of the island's water supply and sewerage systems. • Water and Sewerage Act (13/1999)
Solid Waste Management Authority	Responsible for systems relating to collection and disposal of solid waste. • Solid Waste Management Authority Act (20/1996) (as amended by Act 2/1997)

The lack of comprehensive, coordinated and integrated approach to CZM in Saint Lucia has allowed existing links among planning and management agencies to remain mostly

weak and ad hoc, and address only a narrow range of issues. Table 2 summarises select CZM areas and highlights some of the gaps, weaknesses and needs. From this summary, three main issues clearly stand out: 1) the need for a more coordinated approach to CZM in Saint Lucia; 2) the need for data collection, monitoring and data management; and 3) the need for a comprehensive and ongoing public awareness programme.

Table 2. CZM: gaps, weaknesses and needs.

Select CZM areas	Current activities	Gaps, weaknesses and needs
Awareness, education and sensitisation	• Presentations to schools; • Public exhibitions; • News media articles; • Production of brochures, posters, videos, booklets, flyers, etc.; • Interviews, panel discussions, call-in programmes; • Mailing lists.	• Irregular; • Often targets a restricted/narrow audience; • Area of focus often narrow, ignoring broader issues; • No comprehensive, ongoing awareness, education and sensitisation programme regarding CZM or the wider environmental issues; • Lack of formal inclusion of issues into the school curriculum (school curriculum covers basic information regarding coral reefs and mangroves at the grade school level); • Need for increased awareness among policy makers; • Need to focus on solutions, alternatives to destructive practices, and options for sustainable use.
Coordination/networking	• Planning and management authorities provide advice via stakeholder consultations, meetings, mailing lists, project committees, boards, etc.; • DCA seeks advice from referral agencies on EIAs and projects development (dependent on project type); • Stakeholder meetings/ consultations used in the process of developing related policy and plans e.g. land policies, climate change issues; • Stakeholder meetings/ consultations used in the process of implementing commitments under relevant international agreements, CZM polices, and integrated development planning.	• Irregular; • Focused on a specific issue or narrow range of issues; • Most linkages are weak and ad hoc; • No formal linkages exist among agencies with direct CZM responsibilities.

Select CZM areas	Current activities	Gaps, weaknesses and needs
Data collection	• Beach profiling • Grain size sampling • Coral reef monitoring (video transects, fish censuses, sediment rates etc.) • Mangrove assessments • Level of sand mined (legal sandmining) through permit system • Fish catch and effort • Water quality • Meteorological data • Number of dives/year • Number of cruise ship passenger arrivals	• With few exceptions, most monitoring activities are irregular; • Many data collection systems are not comprehensive (only target a few areas); • Data is often collected but not processed and analysed; • Data and information collected rarely filter into the decision-making process.
Data management systems	Database systems • Registry of fishers • Registry of fishing vessels • Registry of sportfishing establishments • Registry of dive and snorkel establishments • Registry of independent dive leaders • Registry of water based taxis • GIS (baseline maps e.g. watersheds, contours, rivers roads, etc.)	• Insufficient priority is given to collection and management of relevant data; • Very little information exists on nearshore processes – such as, wave data, nearshore currents, shoreline dynamics, etc.; • No comprehensive baseline data set on resources within the coastal zone (e.g. type, extent and status); • GIS database is in need of updating (to include not only recently constructed manmade structures, but also more accurate information on natural resources (especially the precise location and extent of these resources).

Coastal zone management initiatives

In 1994, to begin to address the myriad of CZM related problems being experienced, the Government of Saint Lucia initiated the development of a coastal zone management framework for St Lucia with a two-year project, the North West Coastal Conservation Project (NWCCP). The goal of this project was to develop an integrated planning and management programme that would address environmental and development pressures along the north west coast (Pointe du Cap – Roseau Bay), as well as facilitate the long term restoration, protection, maintenance and sustainable use of coastal resources within the project site.

In 1997, a second phase of the NWCCP was initiated. The primary objective of this study was to assess contaminant inputs and loadings to the northwest coastal area and,

from this evaluation, to develop recommendations and an action plan for the northwest coastal zone and related watersheds. The findings of this study showed that degradation of marine and coastal resources was mainly a result of land based activities such as soil erosion from plantations and introduction of sewage into riverine and coastal waters.

Although the NWCCP focused on the northwest coast, the project recognised that, in order to adequately address the problems occurring in this region, it had to make overall recommendations for CZM in Saint Lucia. These recommendations included the development and implementation of a public education programme; establishment of a Coastal Zone Management Unit (CZMU) within the public sector, along with a multi-sectoral advisory committee; and formulation of CZM legislation to address issues such as the need for environmental impact assessments, liquid and solid waste disposal, and setbacks and other buffer zones. Interestingly, the new Physical Planning and Development Act, which has yet to be promulgated, and the newly drafted Solid Waste Management Authority Act, seek to address these issues.

In 2000, after completion of assessments of the damage resulting from Storm Lenny (1999), the Government of Saint Lucia sought assistance from the Natural Resources Management Unit of the Organisation of Eastern Caribbean States, to develop strategies to address the island's coastal issues. The recommendations coming out of this initiative included the establishment of a CZMU, several environmental policy interventions, changes to environmental legislation, and changes to the institutional arrangements for the management of coastal resources.

At present, the Government of Saint Lucia is seeking to establish a CZMU. The establishment of this Unit is to take place in two phases; in the first phase (which commenced in April, 2001), a two-year Coastal Zone Management Project has assumed the task of amalgamating the outputs of all the aforementioned initiatives, as well as seeking and assimilating the contributions from the public into a comprehensive policy for CZM in Saint Lucia. This initiative will further recommend institutional arrangements and guidelines for CZM in Saint Lucia. The policy and guidelines will be

the foundation for the second phase, which is to implement the recommended institutional structure and devise a work programme for the impending CZMU.