



Ministry of Foreign Affairs  
and Foreign Trade



Natural Resources  
Conservation Authority

**CWIP**

Coastal Water Quality  
Improvement Project

# TOWARD DEVELOPING A NATIONAL POLICY ON OCEAN AND COASTAL ZONE MANAGEMENT

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## EXECUTIVE SUMMARY

Jamaica has a history of use of and dependence on the ocean and coastal resources. These resource ranges from the diverse living ecosystems such as coral reefs, mangroves and seagrass beds, to non-living resources such as sand. Industries have historically grown around coastal centers and today more than half of the population lives in coastal areas. Over the years Jamaica's ocean and coastal resources have been diminished and degraded and we must protect and enhance them to ensure long-term sustainability.

The Council on Ocean and Coastal Zone Management was established in 1998, with a mandate that included definition of national policy. To this end, the Council identified the need for a rational, harmonized national policy on ocean and coastal resource management. This policy is presented in this document.

Background information is given on the rationale for integrated coastal area management, the role of the Council and the development of this policy. Five Policy goals are identified:

1. Promotion of Sustainable Development
2. Conservation of Ocean and Coastal Resources and Ecosystems
3. Baseline Data Collection and Research
4. Utilizing the Role of Science and Traditional Ecological Knowledge for Integrated Coastal Area Management
5. Providing the Conditions of Governance Required for Effective Integrated Coastal Area Management<sup>1</sup>

Specific Policy objectives are outlined under each of these goals, as well as principles that the Policy upholds. Several Policy-related issues have been identified including the issue of boundary definition; critical sustainable development issues; ocean and coastal resource conservation issues; and governance and capacity enhancement issues. A range of strategies has been put forward for achieving the policy goals identified and addressing the issues raised. Within these strategies responsible institutions/agencies have been identified, as well as specific actions which are required to meet the policy objectives and desired results.

The institutional framework for policy implementation is outlined, as the adequacy of the institutional base is a key consideration in effective ocean and coastal resources management. Institutions/agencies identified include government agencies, Parish Councils, Civil society, private sector organizations, academic and research institutions and intergovernmental organizations.

The legal framework for policy implementations is given and clarified under national laws, declarations and orders, regulations, policy papers and guidelines. International commitments are also given and include global, as well as regional, treaties and conventions.

The proposed role of the Council has been delineated with respect to the implementation of the policy.

Appendices to the Policy include a glossary of relevant terms, institutional lists with coastal-related mandates, functions or activities, a list of references and a parish review. This review of existing coastal and marine conditions by parish, gives an overview of the geographical setting, existing developments, current activities, environmentally sensitive areas, existing and propose protected areas, critical issues and problems and potential opportunities. This review has been prepared in an effort to ensure that this Policy on ocean and Coastal Zone Management adequately reflects the current issues within each parish and that the Policy meets the needs of critical issues.

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<sup>1</sup> For the purpose of this policy document, the terms coastal zone management, coastal area management, integrated coastal area management and integrated coastal zone management are used interchangeably.

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## 1.0 INTRODUCTION

### A VISION

Jamaica's shores are of worldwide renown. The beauty of its coastal features has drawn millions of visitors. Its ocean waters have provided bountiful harvests to countless generations. Over the years, however, these attributes have been diminished and degraded. It is our generation's obligation to accept stewardship of Jamaica's ocean and coastal resources; to protect and enhance them, to be passed on to future generations. This is not a simple task, but it is a challenge that we are duty bound to accept. With wisdom, and with determination, this commitment to the future will be realized.

### 1.1 The Council on Ocean and Coastal Zone Management

As a Caribbean island state, Jamaica has a history of use of, and dependence on its ocean and coastal resources. These include wetlands and mangroves, swamp forests, estuarine areas, cays, coral reefs, coastal lagoons, and sea grass beds. For decades these ecosystems provided the resource underpinnings for tourism, fisheries, shipping and craft. Some of these economic activities now face the prospect of increasing resource degradation and depletion. If the economy of Jamaica is to meet the needs of the present population, as well as sustaining future generations, stewardship of its natural resource patrimony is imperative.

At present, there is no comprehensive policy for ocean and coastal resources management. Policy now has to be inferred by reference to various Acts of Parliament. This has resulted in needless delay in initiating programs that address critical coastal management issues. To rectify this situation, the Government established the Council on Ocean and Coastal Zone Management (COCZM) in 1998, based on Cabinet Decision No. 5/98, with a mandate to define national policy, promote co-ordination of administrative and operational functions among government agencies and civil society, and ensure compliance with enacted treaties and protocols. The Council presently resides in the Ministry of Foreign Affairs and Foreign Trade. It was this Council that identified the need for a rational, harmonized national policy on ocean and coastal resource management.

Council membership consists of directors or senior officials of agencies whose roles and functions pertain to ocean and coastal affairs. Its immediate task has been to formulate an integrated ocean and coastal policy for Jamaica, and to work toward establishing a center of excellence in ocean and coastal research and training. Its future role and specific functions are subject to further dialogue.

Progress in developing a center of excellence has been initiated in discussions with the academic and research community, which has representation on the Council. Relative to policy, it may be anticipated that the Council will assist in facilitating the implementation of an ocean and coastal resources policy through a consultative process among respective agencies and stakeholder groups. Given its current mandate from Cabinet and its broad agency representation, the Council is in a position to provide oversight and guidance to ensure that program activities and project decisions are consistent with national policies and international obligations for the sustainable development of Jamaica's ocean and coastal resources.

Global and regional treaties and conventions represent commitments by the Government of Jamaica to the international community. The long-standing interest that Government attaches to Jamaica's role in ocean and coastal affairs is reflected in its decision to act as host country to both the International Seabed Authority and UNEP's Caribbean Action Plan, Regional Co-ordinating Unit. In recent years, Jamaica has signed and ratified numerous global and regional treaties and conventions. However, diffusion of responsibilities for coastal area management has hindered the timely response of pertinent agencies to programmatic actions mandated by

the many international treaties and protocols.

## **1.2 Aim and Objective of the Policy Document**

The aim of the policy document is to develop a policy that will enhance the contribution of economic sectors to the integrated management of coastal areas by developing awareness in sector line agencies and resource users. More importantly, the document will be a direction for planners and resource users in each of the economic sectors to take environmental impacts into account in plan formulation.

The policy document also defines elements necessary for integrating sectoral policy and planning into coastal area management, including requirements for appropriate legal mechanisms, conflict management, institutional coordination, and capacities for improved research and training.

## **1.3 Development of the Policy Document**

Once accepted by Government the policy will provide direction and focus for the actions and activities of relevant government agencies and civil society. A focused national policy on ocean and coastal resource management, supplemented by an Action Plan, will provide the necessary framework for initiating strategies to harmonize sector programs and assist in the rationalization of Government's national, regional and international roles and responsibilities.

The policy will initiate a dynamic policy process that is explicitly designed to evolve through experience. This requires continuous improvement of the information base, ongoing assessment of policies, administrative arrangements and options for problem resolution, and a robust administrative system.

The present document evolved from an incremental process that began in 1998. As noted in the diagram on page 9, this process is intended to continue, leading to the preparation of a White Paper for submission to Cabinet before the end of 2002.

## **1.4 What the Policy will Achieve?**

The objective is to achieve sustainable development of coastal resources.

Broadly:

- Enhancing national institutional capacities for integrated coastal zone management;
- Integrating planning and management of the fisheries, agriculture and forestry sectors into coastal area management;
- Preventing and controlling environmental degradation in coastal areas.

Specifically:

1. Implement effective domestic integrated coastal management strategies.
2. Incorporate integrated coastal management goals in local level strategies, as an element of improved commitment to sustainable development at the highest levels.
3. Encourage community-based participatory approaches in coastal planning and management planning, and in conservation of critical habitats, and develop an integrated decision-making process including all sectors, to promote compatibility and a balance of uses.
4. Facilitate and catalyze private sector action to contribute to effective management of coastal resources.

5. Develop a special focus on the relationship between coastal towns, communities and their marine environment.
6. Consider fully, the activities in upland areas inasmuch as these affect the coastal environment and planning.
7. Improve assessment, management and exploitation practices to conserve and sustain marine living and non-living resources.
8. Foster individual and collaborative research that supports integrated coastal management; refines knowledge of the sources, impacts and fate of marine pollutants; increases understanding of sensitive and critical habitats in the region; and improves marine resource assessment and management practices.
9. Share knowledge and information by developing linked networks that address specific research, coastal and resource management practices, and policy issues.
10. Develop practical measures to expand the base of appropriate technology that supports sustainable management of Jamaica's marine resources.
11. Promote the development and application of innovative economic instruments for generating necessary revenue and financing in combination with effective monitoring and enforcement of resources and environmental regulations.
12. Strengthen the human capability towards a better management of the marine environment
13. Strengthen institutions responsible for marine affairs by defining responsibilities, mandates and coordination.
14. Develop and apply tools to translate technical and scientific issues for the use of policy makers in decision making.
15. Develop and provide tools to engender effective participation in planning and management by local communities and government, NGOs and the business sector.
16. Consistently include in components of the Action Plan provisions to involve stakeholders, in particular local authorities and communities and relevant social and economic sectors, both public and private.
17. Encourage the recognition of the basic linkages between sustainable management of coastal and marine resources, poverty alleviation and protection of the marine environment.
18. The program will be accountable for its actions and will demonstrate that it has the capacity to resolve conflicts and implement its policies and plans.
19. Develop and harmonize existing laws and policies

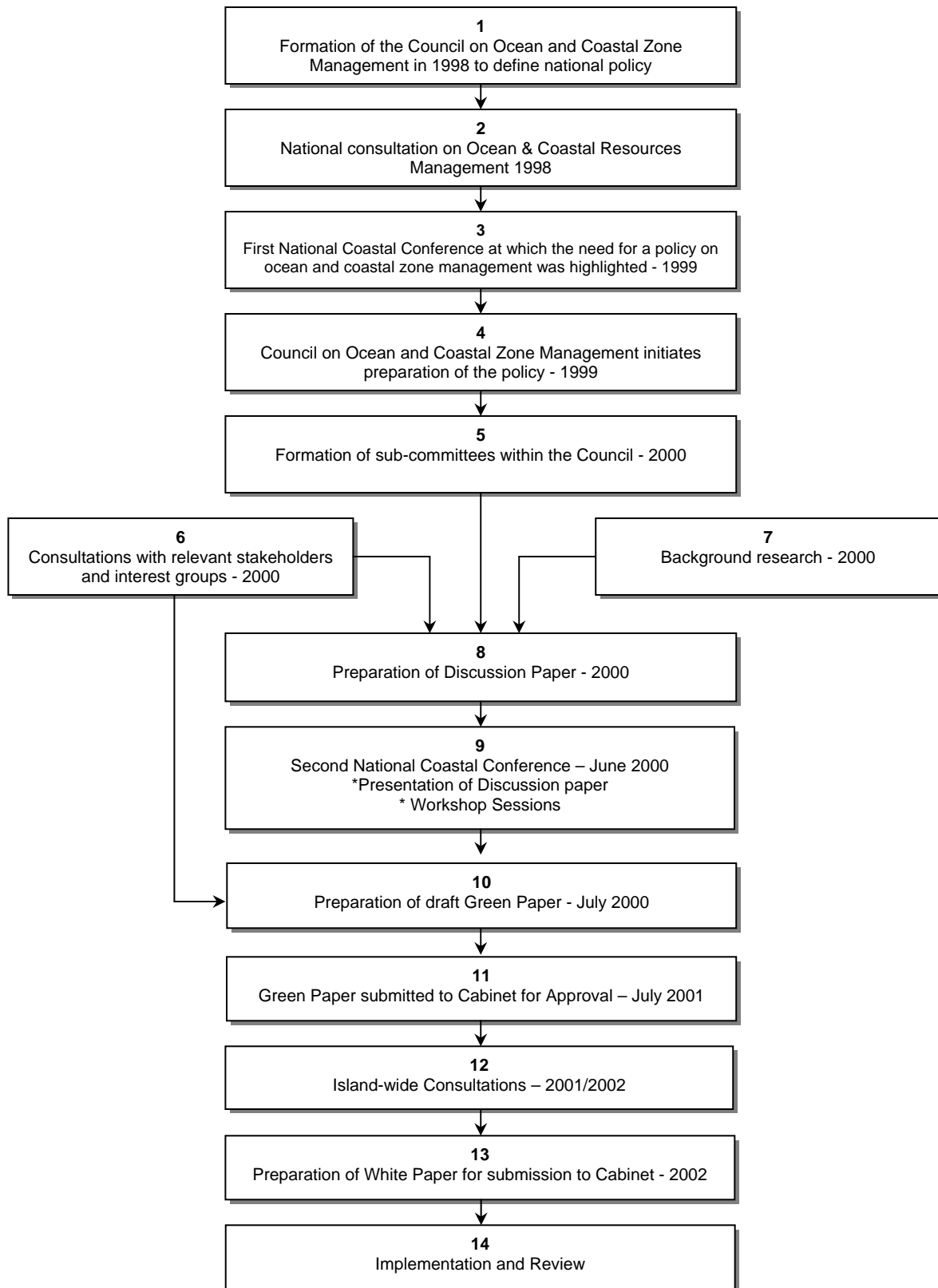
## **1.5 What will be the End Result of Policy Implementation?**

### ***Performance Measures***

1. Effective integrated coastal management practices incorporated in local environmental management programs.
2. Coastal environmental and economic goals integrated in local planning strategies.
3. Successful collaborative ventures addressing problems pertaining to inter agency management.
4. Measurable improvement in the quality of the coastal waters, as a result of comprehensive approach to prevention, reduction and control of pollution.
5. Local economies able to meet the obligations or spirit of the national policy and action plan to prevent, reduce and control marine pollution.
6. Enhanced sustainable use and conservation of marine living resources throughout the region.
7. Enhanced protection of critical habitats, biological diversity and normal ecosystem function, on which sustainability of commercially important marine resources depends.
8. Reduced adverse effects of maritime transport and tourism industries on marine resources.
9. Research, exchange of information, technology and expertise.
10. Broadened application of technology to support sustainable development of the marine environment.
11. Strengthened human and institutional capability.
12. New approaches developed to improve decision making at the highest levels.
13. Broaden participation at all levels in integrated coastal and marine management.
14. Public and private sector participation and partnership.
15. Communities, business and governments involved collaboratively in action to assure the sustainability of the marine environment.
16. Effective legal and policy framework
17. Effective enforcement of laws and regulations



## 1.6 Policy Formulation Process



## 2.0 POLICY-RELATED ISSUES

### 2.1 The boundary issue

### 2.2 Critical sustainable development issues

- Fisheries
- Mariculture
- Forestry and watershed management
- Agriculture
- Recreation and Tourism
- Mining and Quarrying
- Climate Change
- Population Concentration
- Coastal Industrial Development
- Ports
- Airports
- Shipping
- Use of the Seafloor
- Access to coastal resources

### 2.3 Ocean and Coastal Resource Conservation Issues

- Pollution
- Sewage Treatment
- Solid Waste
- Living Resources
- Parks and Protected Areas
- Ecosystem Management
- Cays
- Light Pollution
- Noise Pollution
- Land Filling (Reclamation)
- Natural Hazards

### 2.4 Governance and Capacity Enhancement Issues

- Decision making
- Conservation Mechanisms
- Exploitation of Protected Marine Resources
- Strengthening the Statutory Basis for Integrated Coastal Area Management
- Mediation and Conflict Resolution
- Minimal Co-management
- Research
- Enforcement Capabilities
- Inadequate Institutional Capacity
- Training and Education
- Roles and responsibilities
- Formal adoption and funding
- Law
- Public education

The number of problems and issues that are pertinent to devising and implementing a national policy for ocean and coastal resources management can be overwhelming since the subject area is so broad, and the affected interest groups are so large and diverse. This section attempts to distinguish between core and derivative issues to ensure that the core issues will be adequately addressed in devising strategies for implementing the major policies.

## **2.1 The Boundary Issue**

An over-riding issue that is frequently raised is “Where does the coastal zone begin and end; how is it defined?” There is no simple answer. The definition is variable, depending upon the problem, subject area, or ecosystem under consideration. The coastal and oceanic environment is a complex web of inter-acting natural and man-made systems. Socio-cultural, economic, environmental, legal and scientific issues pertaining to these systems tend to defy easy spatial or geographic delineation.

For purposes of this policy the coastal zone (or more accurately, the coastal area) pertains to the entire area influenced by, and influencing coastal and ocean resources and ecosystems. In the case of estuaries and coastal watersheds this boundary might extend well inland of the narrow land-sea interface. In order to achieve the goals and objectives, the boundaries are considered to extend as far seaward as necessary, with a primary focus on the land-sea interface. Integrated coastal area management represents a flexible, cross-sectoral, inter-agency, and multi-jurisdictional effort to respond to the many and varied issues affecting the biological and physical resource base within this wider coastal and oceanic environment. Rather than trying to define the area in any absolute fashion, at this stage in the policy planning process, it would be more appropriate to allow the particular issue under consideration to determine how the boundaries of the program or project area are drawn. While holistic in conception, coastal area management needs to be practical in execution.

## **2.2 Critical Sustainable Development Issues**

### **Fisheries**

Fish harvesting practices in Jamaica range from the use of fish traps, gill nets, drag nets and trawlers, to spear fishing and the use of dynamite and chemicals. Over-fishing by all methods, as well as the harvesting of juveniles, has resulted in an overall decline in the fishable stock. Dynamite is particularly destructive as it causes physical damage to reef structures and kills species not intended for catch.

**Major issues include inadequate personnel and equipment at the Fisheries Division; lack of necessary enforcement arrangements with relevant agencies such as the Coast Guard and Marine Police; prevalence of unsustainable fishing methods; lack of fishers’ organizations with a management focus; inadequate education of fishers and others involved in the sector, insufficient research to support sustainable fisheries, and lack of stock assessment.**

### **Mariculture**

Mariculture activities include oyster culture, Irish moss culture, marine cage culture of acclimated freshwater tilapia and culture of panaeid shrimp.

**Issues associated with mariculture practices include conflicts over access to the foreshore, water column and sea floor; conflicts over tenure; exclusive harvesting rights; compensation for loss of traditional rights; polluted discharge from operations; degraded quality of adjacent waters; reduction in aesthetic appeal at production sites; and illegal mangrove cutting.**

## **Forestry and Watershed Management**

Forests in Jamaica are under severe threat due to clearing the land for cultivation, fuel wood, round log stakes and charcoal production. The natural forests are usually located within the upper reaches of watersheds. Poor watershed management practices can give rise to changes in near-shore salinity levels affecting mangrove habitat, and heightened sedimentation flows which can impact coral reefs and sea grass beds. Non-point source pollution from agro-chemicals and unplanned residence in the hinterland are also problems.

Issues associated with the forestry sector are, **deforestation of primary and secondary forests**, inadequate watershed management, **conflicting agency roles and responsibilities**, and **reduction of catchment** (A watershed policy, prepared in 1999, addresses most of these issues) as well as, lack of integration into the coastal management planning.

## **Agriculture**

The population concentration adjacent to the coast in Jamaica, coupled with steep topography, hillside lands are used for agriculture. This results in severe soil erosion that eventually reaches the marine environment. Furthermore, unsustainable use of chemicals and fertilizers (use of chemicals for agriculture continues to rise as indicated by import increases of 95% for 1996 over 1995 levels) form part of the agricultural run off that contaminates the marine environment.

**Main issue includes insecurity of land tenure and lack of credit. This leaves the small farmers, who are oblivious of sustainable development, with little option but to resort to any available means for subsistence. General lack of awareness within the agricultural community of the contribution of the agriculture sector to the pollution of marine environment as well as, the lack of integration of the agriculture sector into the coastal management planning are issues that also need to be tackled.**

## **Recreation and Tourism**

Recreational use of the coastal zone involves both overseas visitors and local residents. Tourism continues to be the major source of foreign exchange earnings for the island. Activities include swimming, surfing, boating, parasailing, jet skiing, fishing, snorkeling, diving and various other watersports. The constant drive to increase the number of visitors to the island results in stress on limited resources and existing infrastructure such as sewage treatment facilities, supply of domestic water and solid waste disposal. Cruise shipping has grown in importance within the tourism sector. Major ports of Jamaica are currently being considered for selection as homeports. This would put the responsibility on Jamaica for providing potable water, and removing and disposing of solid waste and sanitary waste.

**Issues involved in coastal and marine recreation include over-use of resources exceeding carrying capacities; lack of adequate zoning; inadequate infrastructure; conflicts over public access; inadequate sanitary facilities and other public facilities; poor facility maintenance and management; excessive coastal development; degradation of water quality; solid waste disposal; beach erosion, and collection of wildlife souvenirs.** (A Ministry Paper on a Beach Policy for Jamaica has been drafted following the presentation of a Green Paper. The Draft Tourism Master Plan addresses some of the major issues related to carrying capacity, tourist beaches, infrastructure and cruise shipping.)

The NRCA and the Ministry of Tourism and Sports is investigating the appropriateness of the European voluntary certification scheme “Blue Flag” as an environmental management tool for Jamaica. The “Blue Flag” is an award system in which beaches that fulfil certain criteria related to water quality, safety, and public facilities, are allowed to fly the Blue Flag. The framework for the scheme includes the existence of a Beach Policy, a Coastal Zone Policy, a mechanism to resolve resource use and user conflicts, adequate public beach facilities and established beach access rights.

### **Mining and Quarrying**

Beaches and dunes as well as river mouths are the primary sources of sand in Jamaica. River sand mining is legally approved although there are illegal operations as well. Mining of beach sand is illegal. Nevertheless it is widespread and enforcement is minimal. Dune sand mining has been approved for one area but unauthorized dune sand mining also occurs. The illegal extraction of sea stones has also been increasing. While there are believed to be large submarine sand deposits, no systematic investigations have been performed, and the financial feasibility of submarine sand mining has yet to be determined. A recent increase in limestone quarrying has generated shipping activity from smaller ports around the island. The longer-term consequences of both sand mining and limestone quarrying needs further study.

**The main issues related to illegal sand mining are changes in river courses, diminished coastal protection, destabilization of river beds, beach erosion, increased turbidity, and flooding.**

### **Ports**

The major ports in Jamaica are Kingston, Port Esquivel and Rocky Point, Montego Bay, Ocho Rios, Port Kaiser, Port Antonio and Port Morant. The Port Authority of Jamaica regulates the ports while the NRCA has responsibility for environmental issues related to port operations. Dry-dock facilities are also important in the port and shipping operations.

**Main issues include the land demand for port facility expansion; demand for recreational marinas; discharge of ballast water in ports; lack of ship-generated waste facilities; inadequate marking of coastal features for small vessels; vessel-generated pollution; dredging and the disposal of dredged material. Issues related to dry-dock facilities include waste disposal, terrestrial run-off of toxic materials and chemicals.** (The Jamaica Shipping Association is currently pursuing the establishment of a Ship-Generated Waste Facility for Kingston.)

### **Airports**

Both of Jamaica’s international airports, as well as the aerodromes for domestic travel are sited in coastal cities and towns.

**Issues related to airports and aerodromes in the coastal zone include jettisoning of fuel in emergencies; risk of oil spill; discharge of industrial effluent; demand for land for expansion and development; and risk of aviation hazards.**

### **Shipping**

Jamaican waters support a high degree of shipping activities including transport of petroleum and petroleum products; import/export freight, and cruise shipping.

**Issues include accidents at sea; risk of spills through local and international transport of petroleum and petroleum products; inadequate channel definition; navigational hazards; discharge of ballast water; island-wide ferry operations; and transport of hazardous material.**

## **Climate Change**

Sea level rise, due to warming of the earth's atmosphere, is predicted to reduce coastal land mass and increase flood risk in low-lying areas. Higher sea temperatures can cause bleaching of coral, and events of bleaching have already been reported in Jamaica.

**Issues include control of emissions of greenhouse gases; increase in extreme weather events and changes in climatic patterns; identification of areas at risk from potential inundation; and enforcement of building design standards and setback regulations.**

## **Population Concentration**

Approximately two thirds of Jamaica's population lives in coastal towns and cities. Inadequate urban infrastructure, and high levels of poverty, combined with the concentration of population in coastal locations have contributed to the pollution of coastal waters and the degradation of coastal habitat. Low-lying residential areas in close proximity to the coast are particularly vulnerable to damage from hurricanes and storm surge, as are squatter settlements in river flood plains.

**Key issues include internal migration from the hinterland to coastal areas; highly concentrated coastal populations; coastal settlements at risk from natural hazards; and inadequate solid waste collection and sanitation infrastructure for settlements adjacent to protected areas and fragile coastal habitats.**

## **Coastal Industrial Development**

The coast has traditionally been the preferred site for Jamaica's industrial and commercial development. Kingston Harbor supports the country's only oil refinery, the cement company operations, an ethanol plant, a power generation plant, commercial buildings, an international airport, shipping and trans-shipment facilities, and various other industrial concerns. Montego Bay and Ocho Rios also support a high level of coastal industrial and commercial activity. Much of this development has been constructed on land reclaimed from the sea, and by the filling of biologically productive coastal wetlands.

**Key issues include criteria for coastal facility siting, risk of oil spills; risk of chemical spills; lack of enforcement of industrial effluent discharge standards; thermal discharge from power plants and other sea-water cooling systems; and industrial emissions.**

## **Use of the Seafloor**

A variety of encroachments have been put on the Jamaican sea floor including conduits, cables, fish pots, artificial reefs and groynes.

**Issues include lack of authority to regulate seabed activities and structures; charges to be levied for seabed use; potential seabed mining and destruction by dynamiting.**

## 2.3 Ocean and Coastal Resource Conservation Issues

### Living Resources

Living ocean and coastal resources consist of marine mammals including manatees, dolphins and whales; sea birds; reptiles such as crocodiles; finfish and shellfish including commercial fish species, conch and lobster; coral reefs and associated invertebrates and vertebrates such as sea turtles; mangroves and associated fauna such as shrimp and oysters; seagrass beds and associated fauna such as invertebrates; and other wildlife. Over the years, there has been a noticeable decline in these resources in both quantitative and qualitative terms.

**Issues include: water quality degradation; improper harvesting practices; over-harvesting of resources; illegal collection and trade of protected species; habitat destruction; and inadequate enforcement of legislation.**

### Parks and Protected Areas

Three marine parks and protected areas have been established: the Montego Bay Marine Park, the Negril Environmental Protection Area (which includes the Negril Marine Park) and the Portland Bight Protected Area. Over 150 sites have been identified as possible additions to the draft National System of Protected Areas (JCDT, 1992). The "Policy for Jamaica's System of Protected Areas" lists 190 sites as candidates for protected area designation. Of these candidate sites, 49 are in the coastal zone and include cays, wetlands, beaches, bays, coves and estuaries.

**Issues include criteria for site selection; site specific legislation; identification of local management entities; identification of financial resources; preparation of management plans; public awareness and public participation in the park planning and management process and sustainable management systems.**

### Exploitation of Protected Marine Resources

Many resources currently protected by both national and international legislation are harvested illegally to supply the pet trade; as a dietary delicacy; for specialist collections or as souvenir items. These include manatees, crocodiles, booby eggs, black coral, and sea turtles and their eggs.

**Issues include the illegal harvesting of protected resources; lack of stock-assessment; lack of manpower to adequately enforce legislated limits; lack of public awareness and public education systems; and habitat destruction.**

### Conservation Mechanisms

The conservation of biological resources is essential because of the high level of biodiversity associated with the ocean and coastal zone environment. Adequate conservation mechanisms must be in place in order to ensure that species are not driven to extinction and that resources are used in a sustainable manner.

**The main issues related to conservation are public awareness and education, enforcement of existing legislation, gaps in legislation, and establishment of conservation areas.**

### Ecosystem Management

The major ecosystems in the ocean and coastal zone environment are coral reefs, wetlands/mangroves, seagrass beds, the rocky shore and the benthos.

**Coral Reefs - The main issues affecting coral reefs include high nutrient levels that result in eutrophication; terrestrial run-off and sedimentation; harmful fishing practices;**

**coral diseases; destruction by natural occurrences and damage by recreational users.** A draft policy has been written for the protection and preservation of coral reefs. The global International Coral Reef Initiative (ICRI) was launched by a coalition of eight governments, of which Jamaica was one. In support of the ICRI Call to Action and Framework for Action, Jamaica is currently preparing a Jamaica Coral Reef Action Plan (JCRAP) which is directed by a JCRAP Steering Committee.

- Wetlands** - **Issues affecting wetlands include improper solid waste disposal, over-harvesting, deforestation, and land fill to facilitate coastal development and expansion.** A draft policy has been prepared for the protection of wetlands.
- Seagrasses** - **Issues affecting seagrass beds include removal of beds by hotel owners, damage from recreational users, damage by seine nets, land reclamation and coastal development.**
- Rocky Shore** - **The main issue affecting rocky shoreline is pollution from improper solid waste disposal.**
- Benthos** - **The main issues affecting the benthic environment include dredging, damage from recreational users, exploration and seabed mining, over-harvesting of benthic species and installation of structures.**

### Cays

Jamaica's coastline is dotted with both near-shore and offshore cays that are used for recreational purposes such as boating and watersports activities as well as for commercial purposes such as fishing. To date, no clear policy exists on the management of these cays or of their resources. Offshore cays include four small limestone islands off the south coast (Morant Cays) and four coralline islands on the southeastern edge of the Pedro Bank (Pedro Cays). The nearshore cays are found mainly off the south coast (and include Lime Cay, Maiden Cay, Bushy Cay and Drunkenman's Cay) with the exception of Booby Cay off the coast of Negril. Lime Cay and Booby Cay are used extensively for recreational purposes.

**Main issues include harvesting of protected resources; over exploitation of commercial resources; lack of carrying capacity limits; lack of sanitary facilities; lack of public facilities; lack of solid waste disposal systems; preservation of archaeological and cultural heritage; exploitation of fisheries resources by non-Jamaican vessels; and lack of a clear policy for cay management.**

### Pollution

Pollution of coastal waters occurs in the form of point source pollution, non-point source pollution and disposal of solid waste. Primary sources include industrial effluent from industries based in the coastal zone. These sources include brewing and bottling, agro-processing (including sugar and rum production), paints and chemicals, oil spills, particulates from quarrying and aggregates, improperly treated sewage by direct discharge or leaching through soak-away pits, pesticides and fertilizers, and solid waste dumped in gullies and rivers which eventually wash out to sea and then is thrown up on beaches.

**Issues related to pollution include illegal industrial discharge and inadequate enforcement of existing effluent discharge standards. These issues are further clarified under sewage treatment, solid waste, noise pollution and light pollution.**

### Sewage Treatment

Improperly treated sewage is a major source of coastal pollution resulting in decreased quality of bathing waters and nutrient enrichment leading to eutrophication. Untreated sewage still enters coastal waters through direct discharge into rivers, streams and the ocean, as well as through soak away pits.



**Issues related to sewage discharge include criteria for sewerage system design and location, sewerage plant operation and maintenance, operator training, cost of connections, quality of effluent discharge, absence of low-cost community systems, and means for disposal of sewage sludge.**

### **Solid Waste**

Solid waste disposal mechanisms in Jamaica are currently inadequate. The most common means of disposal of rubbish is in gullies and waterways. Plastics, metals, glass and other types of material get washed out to sea after forceful rainfall events. Material may eventually get washed up onto beaches, rendering these beaches unsuitable for recreational use. Solid waste is also harmful to wildlife, particularly birds, fish and turtles that feed at the surface of the water and mistake floating debris for food. A National Solid Waste Management Strategy, which will see the establishment of a National Solid Waste Management Authority, was tabled in Parliament in May 2000.

**Main issues related to solid waste disposal are the lack of an adequate number of public receptacles, inadequately managed dump sites, lack of enforcement of existing legislation and lack of relevant public education programs.**

### **Light Pollution**

Continuous coastal development has resulted in modification of the shoreline by buildings and their facilities for lighting. Bright lights on beaches and other coastal areas not only affect aesthetic value of an area but also have ecological consequences, particularly affecting sea turtles that come ashore to nest at night, and the passage of hatchlings to the sea. Artificial lighting overrides natural lighting and results in disorientation, which can result in significant loss of specimens.

**Main issues related to coastal light pollution are coastal developments and improper beach lighting and signage.**

### **Noise Pollution**

Increased use of motorized watersports equipment results in increased levels of noise that affect both the aesthetic value of a recreational area and disrupt fish populations. Fish populations may be fragmented and stressed by the noise created from jet skis and motorboats.

**Main issues related to noise pollution are conflict in zoning watersports and fisheries areas, and the lack of carrying capacity limits for motorized watersports.**

### **Land Filling (Reclamation)**

Population and economic growth has resulted in land reclamation and filling throughout Jamaica's coastal perimeter. This has led to habitat destruction, and coastal erosion through altered patterns of near-shore currents.

**Issues pertain to meeting the need for additional land area to provide space for new development and urban expansion. These issues must be addressed on an inter-sectoral basis.**

### **Natural Hazards**

**Jamaica's geological origin, topographical features and seasonal high rainfall make it susceptible to a range of natural hazards that can affect the coastal and oceanic environments. These include storm surge, slope failures (landslides), earthquakes, floods and hurricanes. These natural events coupled with existing settlement practices and stressed ecosystems create the potential for disasters.**

**Main issues include siting of coastal settlements, threat of sea level rise, structural damage to reefs,**

**destabilization of seagrass beds, destruction of mariculture facilities and beach erosion.**

## **2.4 Governance and Capacity Enhancement Issues**

### **Development Decision-Making**

Decision-making is only as good as the information that is available to weigh the choices. Senior officials are frequently confronted by the need to commit to a particular program or project proposal without adequate information to make a balanced judgement. Time pressures can preclude waiting for appropriate assessments to be completed. The use of “fast tracking” for major projects often circumvents regular project review procedures. Such situations need to be anticipated and means developed to accelerate response capabilities.

**Issues include developing procedures to combine agency resources to streamline response times.** It also emphasizes the importance of establishing analytical databases that are designed to aid in development decision-making. Additionally, mitigation strategies need to be developed whereby the resource agency is in a position to more effectively negotiate an outcome. There are numerous analytical tools to aid in decision-making. These can be jointly developed and shared among those agencies involved in integrated coastal area planning and management

### **Strengthening the Statutory Basis for Integrated Coastal Area Management**

While there currently exists a statutory basis for managing coastal resources, there are significant areas of overlapping responsibility and uncertain jurisdictional divides between government agencies. The legislative basis for integrated coastal area management needs to be strengthened. The need for legislation specifically addressing coastal issues is becoming increasingly apparent. Such a statute could respond to acknowledged shortcomings in the Beach Control Act as well as consolidating those aspects of other laws (Wildlife Protection Act, Quarries Act, Fisheries Industry Act, etc.) that relate to the planning and management of coastal resources.

**In preparing the background for new legislation, a wide range of jurisdictional and regulatory issues could be addressed including clarification of agency mandates, streamlining the project permitting and review process, rationalizing the allocation of financial resources and strengthening enforcement capabilities.**

### **Mediation and Conflict Resolution**

Because of the competition for coastal access, the provision of licenses for exclusive use, zoning issues, conflict between interest groups can be intense. Timely and effective resolution of conflicts can be achieved through the use of mediation measures in which Government acts as a facilitator as well as an active participant and advocate for the public interest.

### **Minimal Co-management**

The concept of co-management is a relatively new one for Jamaica, and one that needs to be developed and applied. The shared management of public facilities such as parks has worked successfully in other countries. The administration of the Negril Marine Park, the Montego Bay Marine Park and the Portland Bight Protected Area are current examples of co-management in Jamaica. Stakeholders include government agencies, non-government organizations, educational institutions, fishers' co-operatives, and international agencies.

**Issues include the extent to which co-management is financially feasible in terms of both private and public interests, effectiveness of facility operation and maintenance, and the availability of community groups, and/or private interests to manage the facility.**

### **Research**

Jamaica has a long-standing and credible history of scientific research in the marine environment conducted mainly through academic institutions. There is considerable scope for expanding the research agenda, particularly in the areas of coral reef management, sustainable fisheries practices, benthic environments, pharmaceutical uses of marine species and algal beds. The review and approval of requests for research activities in Jamaican waters is currently a divided function. Research by overseas entities is approved through the Ministry of Foreign Affairs and the Ministry of Justice. Research by local entities is approved through the NRCA. A project proposal for the establishment of a Research Institute (Center of Excellence), including the acquisition of a research vessel, for research in the field of natural marine science as well as social science related to coastal management, has been developed. Once approved by the Council, external funding will be sought for its development.

**Issues include government support for applied research to assist in coastal area planning and project decision-making; establishing closer integration between government and academic research directions and priorities; improving access of agency personnel to existing research findings and to an even wider knowledge base outside the island itself; and an integrated system for regulation and monitoring of both local and overseas groups undertaking research in Jamaica's coastal zone.**

### **Enforcement Capabilities**

Inadequate enforcement ultimately leads to a breakdown in legal processes and is a major problem in the management of ocean and coastal zone resources. Enforcement units that are under-staffed and without adequate vehicles or boats are unable to function effectively, and undermine the integrity of the legislation and licensing systems that are in place. In many cases adequate legislation already exists, but the lack of enforcement creates opportunities for over exploitation of resources, illegal exploitation of protected resources such as sea turtles for eggs and meat, illegal effluent discharge leading to degraded water quality, and illegal sand mining.

**Issues include feasibility of expanding the stakeholder role in enforcement; improving liaison with the judiciary on expediting the processing of violations; education of judiciary on the relevance of environmental issues; unrealistic and outdated fines, and possible use of JDF to supplement enforcement personnel.**

### **Inadequate Institutional Capacity**

Many government agencies are under-staffed, provide insufficient training opportunities for skill development, lack supporting facilities, and do not have the financial resources for effective program implementation. **Issues pertain to ways of leveraging resources by the consolidation of agency efforts; increasing budgetary allocations for in-service education and training; up-grading of technological capacity through use of the Internet, geographic information systems, remote sensing, and opportunities for regional technology transfer through partnership arrangements with regional entities; lack of adequate system of budgetary allocation and identification of financial resources.**

### **Training and Education**

Formal training in ocean and coastal zone issues occurs mainly at the tertiary level. Relevant subjects are included in some secondary school curricula. Informal training also occurs through workshops in the tourism sector or through ENGO's.

**Main issues are the lack of curriculum for environmental science and related topics at the primary level and inadequate coverage in the curriculum at the secondary level.**

### **Roles and Responsibilities**

The main purpose of the policy is to develop a management plan that constitutes "a vision for the future". The policy, through the Action Plan will express, in realistic and tangible terms, the quality of the environment to be achieved and maintained, the way in which the resources should be allocated and any necessary changes in patterns of resources use and human behavior. It is important to ensure that this process of planning and evaluation of options provides sufficient time for meaningful incorporation of stakeholders at the community level such that constituencies are built that will actively support the management objectives and strategies that are selected as the program's focus.

**Delineating the roles and responsibilities of agencies as they relate to priority coastal management issues will be a prerequisite to ensure the long-term sustainability of the policy implementation process. Therefore, roles and responsibilities of the various members of the Council will form part of the Action Plan on ocean and coastal management.**

### **Formal Adoption and Funding**

The Action Plan will include consideration and agreement of a budget (levels and sources of funding) for each phase of the program.

**The issue therefore is the need to ensure adequate funding. A formal approval often does not guarantee proper funding. Securing the funds required for implementation of an integrated coastal management plan may require another round of planning to review possibilities for cost reduction and increased efficiency and perhaps a slower rate of implementation.**

### **Law**

Once formally adopted, the integrated coastal management program will need to be institutionalized through legislation. Formalized coastal management programs will therefore have continuity as independent organizations or as a program administered through a network of organizations.

**In both cases roles and responsibilities for planning and implementation will be clearly defined. More specifically, legal provisions for NGO advocacy for nature and its non-human components have to be an integral part to the extent that it is guaranteed by a legal foundation.**

### **Public Education**

A key topic to address is the concept of sustainable use of resources, which needs to be explained in both environmental and socio-economic terms.

**The issue here is to involve community groups in the design, conduct and interpretation of research that has the potential to lead to management decisions that seriously affect them. Otherwise they are likely to deny the validity or implications of the research results and oppose strongly the decisions based on them.**

## **2.5 Rationale For Integrated Coastal Area Management**

Jamaica's coast has long been a magnet for urban expansion. Residential, industrial and commercial uses all compete for space within a finite area between the uplands and the sea, with the greatest concentrations occurring adjacent to the coast. Pressure for coastal development has been exacerbated by the migration of population from rural areas to coastal towns and cities. Haphazard, unplanned and undirected urban growth is a growing threat to the sustainability of fragile coastal and marine ecosystems. To avoid irreparable damage to natural systems, urban growth policy needs to be closely coordinated with policies for the management of coastal and marine resources. Integrated planning is particularly vital for lowland areas that are vulnerable to hurricane-induced storm surge and coastal flooding. Lowland vulnerability is further increased by sea level rise as a result of global warming, a phenomena that is particularly threatening to ocean islands. To protect people and property, inter-agency co-ordination in planning for natural hazard mitigation needs to receive priority attention.

### **3.0 GUIDING PRINCIPLES**

The foregoing policy issues are converted into policy goals and strategies in Section 4 based on the following principles:

#### **For sustainable management of coastal resources:**

##### **3.1 Precautionary Principle**

According to the precautionary principle, lack of scientific uncertainty is no reason to postpone action to avoid potentially serious or irreversible harm to the environment. The principle demands a measure of care and foresight that requires the integration of environmental concerns into every aspect of governance. The legal ramifications of the principle involve shifting the burden of proof, from those supporting environmental regulation to those engaged in the activity being opposed, to establish that such activities would not adversely affect the environment.

##### **3.2 Polluter Pays Principle**

There are two aspects to this principle:

- a) Internalize the cost of economic activities to prevent potential harm so that the cost is not imposed on society as a whole. The principle requires that all costs, including costs to the environment, be included in the decision-making process of the potential polluter. One of the ways of internalizing the environmental costs is to set standards which the potential polluter then pays the costs of meeting.
- b) If there is pollution then the costs are incurred by the responsible party in such a way that the cost to the society is minimized.

##### **3.3 Inter-Generational Equity**

This principle relates to justice and fairness vis-à-vis questions of environment and development. It reflects the view that as members of the present generation, we hold the earth in trust for future generations and therefore we should not preclude the options of future generations. The principle basically refers to the obligation to take into account the needs of other users.

##### **3.4 Global and Regional Dimension Of Environmental Impacts**

The global, and regional, dimension of environmental impacts of actions and policies related to coastal management should be recognized and considered. Nevertheless, integrated coastal zone management at the local scale is critical to achieving overall sustainability. So far, such local action is largely only incidentally related to global targets and mainly represents a continuation of conventional approaches to coastal environmental issues. This policy seeks to identify ways in which local activity (and in particular, proposals for integrated coastal zone management) can be evaluated in terms of its contribution to global sustainability.

#### **Operational principles for the implementation of the policy:**

##### **3.5 Transparency in Decision-Making**

Decisions should be made in a manner that allows for open review and discussion. Information and analyses that have an impact on the decision should be available to the public. These would include environmental assessments, comments prepared by reviewers, and relevant correspondence between government agencies and involved stakeholders. In the case of complex projects, sufficient

time should be permitted for meaningful review and comments by the public.

### **3.6 Decentralized Planning**

The long-term goal of the policy should be that of decentralized planning with local level planning under the aegis of the Council.

### **3.7 Inclusiveness: Stakeholder Participation in all Phases of Planning and Implementation**

Government should establish procedures for informing stakeholders of programs and projects that are under consideration for adoption and approval. In the case of projects being submitted for review by private interests, as well as those proposed by government, stakeholders should have an opportunity to be involved in the “scoping” process at a very early stage. To the extent practical, stakeholders should have an on-going role throughout the planning and implementation process. Additionally, stakeholders having had previous access to or use of a resource should receive priority consideration if the project offers opportunities for future employment or management participation.

### **3.8 Equitable Distribution of Environmental Resources**

Coastal resources management should be designed to benefit all segments of the population, including for the benefit of present and future generations. Compensation should be awarded to those who unavoidably incur costs or damages as a result of program or project implementation. In assessing impacts, cultural as well as economic consequences must be considered. Compensation measures and/or mitigation costs should be included in the financing plan. Public rights of access should be rigorously protected. Where access rights cannot be guaranteed, mitigation options need to be negotiated. Agreement on mitigation should precede project or program approval. Where environmental loss or degradation is an unavoidable consequence of program or project actions, mitigation measures must be undertaken to restore or create comparable environmental values.

Ensuring high levels of coastal water quality together with the protection of fragile coastal ecosystems should be accorded the highest priorities. Minimal change should be made to watercourses and to the configuration of the coast. In general, nonstructural solutions to problems such as flood control and shore protection are preferable to the use of engineering or structural solutions.

### **3.9 Recognition of Traditional Rights and Uses**

Recognition should be accorded to traditional rights and use patterns.

### **3.10 Effectiveness in Program Implementation**

In designing programs, realistic targets must be established. Resources should be allocated to the solution of priority problems. Before committing to a program, adequate institutional capacity must be in place. Innovation and experimentation should be encouraged in program and project implementation.

## 4.0 POLICY GOALS, OBJECTIVES AND STRATEGIES

The goal of integrated coastal zone management (ICZM) is to improve the quality of life of human communities who depend on coastal resources while maintaining the biological diversity and productivity of coastal ecosystems. This requires the active and ongoing involvement of the interested public and the many sectoral groups with interests in how resources are allocated, development options are negotiated and conflicts mediated. Therefore the ICZM process will need to integrate government with community, science with management, and sectoral with public interest in preparing and implementing actions that combine investment in development with the conservation of environmental qualities and functions. To effectively manage the island's ocean and coastal resources, inter-sectoral strategies must therefore be devised that also involve participation by multiple stakeholders.

The ensuing section puts forward five policy goals and a range of respective strategies for achieving the sustainable management of coastal resources. They also respond to the issues highlighted in the previous section.

It is to be noted that the goals and objectives need to be considered as a package along with the guiding principles delineated in Section 3. A balanced approach is required that takes into account all these objectives and principles to pursue the goal of ICZM.

### **Goal 1: Promotion of Sustainable Development**

A principal goal of coastal zone management is to assure that the various demands placed on limited and fragile coastal resources are managed so as to contribute to long-term, sustainable development in the interests of all segments of Jamaica's population. Competing interests are placing enormous demands on limited resources. It is essential that short-term gains be not allowed to foreclose the long-term interests of the society at large.

New urban expansion and industrial development pose threats to coastal eco-systems as do exploitative harvesting practices. Over-building, driven by powerful market forces as well as poverty among some sectors of the population, and destructive exploitation contribute to the decline of ocean and coastal resources. The balancing of economic growth and resource conservation will require active stewardship, together with expanded efforts at consensus-building among diverse and often contending groups of resource users -- from artisanal fishermen to hotel developers.

In addition to providing development guidance to protect and enhance the coastal and ocean resource base, development strategy must incorporate measures to minimize the potential risk to lives and property from natural hazards. These hazards include earthquakes, hurricanes and ocean storm surge, among others. The dangers posed by such hazards are exacerbated by climate change and sea level rise, with potential inundation of low-lying coastal areas. This phenomenon is particularly threatening to small island states where public infrastructure, settlement patterns and predominant economic activities are highly concentrated at or adjacent to the land-sea interface.

Specific policy objectives include:

- 4.1.1 Develop sustainable fisheries practices
- 4.1.2 Ensure sustainable mariculture techniques and practices
- 4.1.3 Develop sustainable forestry practices and watershed management
- 4.1.4 Develop sustainable agriculture practices
- 4.1.5 Promote sustainable tourism practices
- 4.1.6 Develop economically feasible and sustainable mining and quarrying activities
- 4.1.7 Sustainable management of ports
- 4.1.8 Sustainable management of airports
- 4.1.9 Sustainable management of shipping



- Use of the Seafloor
- Climate Change
- Population Concentration
- Coastal Industrial Development

#### 4.1 Strategies for Goal 1

<b>STRATEGY 4.1.1: Develop sustainable fisheries practices</b>	
<p>The Fisheries Division currently lacks sufficient personnel. This has severely hampered its work. The decline in the standards at the fishing beaches needs to be addressed and adequate sanitary and waste disposal facilities put in place. Incentives should be adopted to encourage sustainable fishing practices. Fines and penalties should be levied for breaches of sustainable practices. Lack of adequate facilities for sanitary, solid and fishing industry waste on fishing beaches needs to be addressed.</p>	
<p><b>Actions</b></p> <ol style="list-style-type: none"> <li>1. Perform stock assessments for all fishable resources</li> <li>2. Set and enforce catch limits for appropriate species</li> <li>3. [Further development][Establishment][Assess the effectiveness] of fishers' organization[s] with a management focus</li> <li>4. Encourage sustainable fishing practices through economic incentives</li> <li>5. Increase fines and penalties for illegal fishing practices</li> <li>6. Development of a National Fisheries Management Plan</li> <li>7. Review and enforce mesh size limits and other gear limitations</li> <li>8. Designate no-fish zones for juvenile and adult species; monitor and enforce closed season regulations</li> <li>9. Continue to regulate and enforce licensing system to further develop a limited access fishery rather than an open access fishery</li> <li>10. Apply co-management principles to the sector</li> <li>11. Identify responsible agency to provide adequate waste disposal and sanitary facilities on all fishing beaches</li> </ol>	<p><b>Institutional Responsibility</b></p> <p>FD NRCA JDF JCF UWI NGO</p> <p><b>Desired Results</b></p> <p>Empowerment of fishers' to participate in co-management of the fishery.</p> <p>Sustainable fisheries industry.</p> <p>Clean and operational fishing beaches</p>

**STRATEGY 4.1.2: Ensure sustainable mariculture techniques and practices**

Sustainable mariculture practices may be a practical solution to relieve the current pressure on the fisheries. Mariculture sites need to be designated and proper facilities established. Economic incentives should be instituted through the Fisheries Division. Provision of material to use for building mariculture equipment would help to eliminate the current practice of using mangroves for raft construction. Issues related to tenure and access to the water column and sea floor need to be resolved. All mariculture enterprises should be licensed and a marketing strategy should be developed to ensure a reliable market.

**Actions**

1. Enhance local NGO capabilities in terms of governance over mariculture activities in their respective areas
2. Ensure designation and zoning of mariculture areas
3. Develop training infrastructure and provide training opportunities in relevant techniques for interested mariculturists
4. Design sustainable operational practices
5. Design structures that do not reduce the aesthetic appeal of mariculture sites or prevent access to other users
6. Further encourage the monitoring of mariculture sites for water quality parameters by the Fisheries Division in partnership with relevant NGOs
7. Implement fines and penalties for breaches in operational practices
8. Identify and promote local and overseas markets for products
9. Ensure the establishment of waste reception facilities at mariculture sites
10. Formalize and rationalize with the existing programs the Draft Mariculture Policy
11. Encourage use of recycled waste products in local industries

**Institutional Responsibility**

FD  
NRCA  
UWI  
NGO's

**Desired Results**

Sustainable mariculture operations that do not pollute surrounding waters and provide products that meet requirements for the overseas market.

Provision of acceptable conditions of access and tenure.

Maintain aesthetic appeal of the coastal zone.

**STRATEGY 4.1.3: Develop sustainable forestry practices and watershed management**

Forests are under severe threat due to land clearing for cultivation, fuel-wood, round log stakes and charcoal production. In Jamaica, natural and plantation forests are usually located within the upper reaches of watersheds. The removal of these trees has had severe impacts on low-lying areas, e.g. increased flooding, sedimentation, and altering river courses.

**Actions**

1. Sound and clear criteria to be employed in land-base classification and allocation, based on environmental suitability and on socio-cultural and economic valuation of direct and indirect benefits provided by different uses
2. An integrated, area-based approach to be taken to the planning and management of coastal forest ecosystems, and coordinated between agencies
3. Multipurpose management to be introduced for individual forests
4. Responsibility for forest management to be devolved upon local institutions and the capability of these to manage forests for multiple purposes must be strengthened
5. A precautionary approach to coastal forest management to be employed and strategies and plans must be flexible and must build on local knowledge and expertise;
6. Public participation to be encouraged in all aspects of coastal forest management planning and implementation
7. Conduct research is needed on the interdependence of coastal forests and other coastal ecosystems and on the quantification and mitigation of negative impacts between sectors
8. Development of legislation on conservation and development of forest systems in coastal areas, in line with agreed integrated management policies

**Institutional Responsibility**

FD (Forestry Dept.)  
NRCA  
UWI  
NGO's

**Desired Results**

Sustainable forestry operations.  
Provision of acceptable conditions of access and tenure.  
Maintain aesthetic appeal of the coastal zone.

**STRATEGY 4.1.4: Develop sustainable agriculture practices**

Given the topography and population distribution in Jamaica, use of steep hillside lands for agriculture is a common phenomenon. This has, in the past, often resulted in serious soil erosion especially when no proper soil conservation techniques are used resulting in silting of important coastal areas facilities. Also, misuse of agriculture chemicals (pesticides, herbicides, and fertilizers) has contributed to water pollution in the coastal areas as well as silting of coral reefs.

**Actions**

1. Perform assessment of:
  - Land use and drainage systems
  - Population size, gender distribution, location, migration, literacy, economic activities and income
  - Environmental legislation and customary laws, their observance and enforcement, labor regulations
  - Principal social and economic actors and representative groups, their goals and strategies
2. Establishment of farmers' cooperatives with a management focus
3. To implement soil and water conservation practices to control cropland erosion and surface water runoff
4. To utilize fertilizers and pesticides in a manner that will minimize their loss and transport towards coastal areas
5. To ensure adequate treatment and disposal of wastes

**Institutional Responsibility**

WRA  
CASE  
UWI  
NGO's

**Desired Results**

Sustainable agriculture operations.  
  
Sustainable use of pesticides and fertilizers.  
  
Provision of acceptable conditions of access and tenure.

**STRATEGY 4.1.5: Promote sustainable tourism practices**

Tourism is the number one source of foreign exchange earnings in Jamaica and, as such is vital to the national economy. Unfortunately, non-sustainable practices have led to a decline in the very base on which the industry was founded and still depends. Diverse tourism initiatives as outlined in the Master Plan for Sustainable Tourism should be explored in order to expand economic opportunities for local entrepreneurship and reduce the pressure on coastal ecosystems.

New approaches to resource use need to be encouraged through subsidies, pilot projects and other incentives. Recent initiatives such as the Blue Flag, Green Globe, Green Turtle and development of Environmental Management Systems must be applied to the industry. In addition to managing marine fishable flora and fauna resources, their potential as non-harvestable resources to support eco-tourism should be encouraged. Traditional practices, such as using glass-bottomed boats for viewing coral reefs, are less intrusive than diver/snorkeller tours. Management practices should be encouraged through the development of heritage trails, sub-marine tours, and nature hikes in coastal locations.

The Jamaica Tourist Board should conduct market studies of alternative tourism. Proper facilities would have to be approved by the Tourism Product Development Company in order to support planned activities. Sites for eco-tourism would have to be provided with sanitary facilities, solid waste receptacles, a first-aid station and/or Ranger Station and adequate signage. The Tourism Master Plan addresses some of these issues. Environmental NGOs and other Civil Society groups should be involved in planning and implementing non-traditional tourist activities.

<b>Actions</b>	<b>Institutional Responsibility</b>
<ol style="list-style-type: none"> <li>1. Provide sewage treatment facilities for all tourist areas</li> <li>2. Determine carrying capacity of the environment prior to planning tourism activities</li> <li>3. Determine carrying capacity for existing and future tourism activities</li> <li>4. Determine infrastructure capacity to support varying levels of tourism without irreversible damage to the marine resource base</li> </ol>	TPDCo. JTB NRCA OPM NGO's UWI
<ol style="list-style-type: none"> <li>5. Provide alternative types of tourist activities.</li> <li>6. Promote non-harvesting use of resources</li> <li>7. Promote alternative tourism options such as eco-tourism, heritage tourism and community based tourism</li> <li>8. Ensure adequate infrastructure, facilities and mechanisms in place to support eco-tourism</li> <li>9. Support efforts to initiate award systems</li> <li>10. Ensure environmental management systems and audits for the sector</li> </ol>	<p><b>Desired Results</b></p> <p>Development of alternative tourism which will reduce the current pressure on resources that support traditional tourism activities.</p> <p>Enforcement of carrying capacity limits for all tourism activities.</p>

**STRATEGY 4.1.6: Develop economically feasible and sustainable mining and quarrying Activities**

Mining and quarrying are important activities in Jamaica and support other sectors such as construction and shipping. Sand and sea stone mining occurs along the coast, depending on the availability of source material. Some of this mining is illegal and is carried out by householders and local builders. Enforcement of existing legislation can be improved. Consequences include alteration in shoreline, destruction of habitat and destruction of aesthetic value.

Near-shore mining of sea sand would alleviate the pressure that currently exists on riverine sand, dune sand and beach sand deposits. While there is no definitive study on the potential supply, at present research is underway. Initial capital outlay is likely to be high and the financial feasibility of such activities has yet to be determined.

**Actions**

1. Enforcement of laws prohibiting illegal sand and sea stone Quarrying
2. Identification of potential near-shore and off-shore on-shore sand deposits
3. Promote the determination of sustainable extraction quantities of sand
4. Identification of equipment and infrastructure requirements
5. Training of relevant personnel
6. Identification of potential areas for mineral mining
7. Identification of suitable markets, local and overseas
8. Identification of specific areas for the utilization of semi precious stones, marbles for utilization in small scale cottage industry
9. Promote and encourage cooperatives for the above cottage industry
10. Seek to identify markets
11. Encourage the use of sand substitutes
12. Seek to minimize pollution from mining

**Institutional Responsibility**

MGD  
UWI  
NRCA

**Desired Results**

Providing an adequate supply of sand and aggregate at reasonable cost to support local building activities, and maintain current levels of export.

Determining feasibility of near-shore, offshore and on-shore mining and quarrying, and where practical, establishing sustainable mining and quarrying.

**Strategy 4.1.7 – 4.1.9: Sustainable management of Shipping, ports and airports**

Shipping is one of the largest industries in Jamaica and as such is critical to the national economy. Increase in ship traffic in Jamaican waters and using Jamaican ports resulting from development of modern port facilities has increased the risk of vessel source pollution and conflicts of use in the coastal zone. Adequate legislation is needed to address the increase in solid and other ship generated waste entering the island. The increase in water sport, fishing and other marine activities involving small vessels has also resulted in conflicts of use and the degradation of the marine environment. The Shipping Association of Jamaica in association with the Scientific Research Council has initiated a project to establish a port reception facility in the port of Kingston. The development of regulations establishing international standards to prevent and respond effectively to pollution from small and large vessels is important. Norman Manley International airport at Kingston and Sangster International Airport at Montego Bay are within the proximity of the coastal zone that would envisage their inclusion as a part of the issue necessary for the sustainability of Jamaica’s coastal zone. The airports have as part of their management policy, to consider environmental issues as part of their development. It nevertheless requires that they be certified under ISO 14000 to be in line with the overall coastal management policy. The International Standards Organization (ISO) has developed the ISO 14000 series of Environmental Management Systems (EMS). Standards such as the International Safety Management Code developed by the International Maritime Organization need to be developed in addition to the development of other standards, which apply to port and shipping.

**Actions**

1. Monitor the construction and expansion of port and other coastal structures as to minimize the environmental impacts
2. Support on going efforts of the SAJ/SRC to establish a Ship Generated Waste Facility in Kingston
3. Develop legislation to incorporate the international conventions on the prevention of pollution from ships (MARPOL, London Dumping, OPRC, CLC and FUND)
4. Develop regulations and guidelines for the prevention of pollution from small vessels
5. Assess the capacity of sensitive marine areas to accommodate shipping activities with a view to restricting or prohibiting the operation of vessels
6. Support measures to ensure certification of sea and airports under ISO 14000 and other internationally accepted standards of certification.
7. Ensure suitable governance arrangements
8. Support initiative for the revision of contingency plans

**Institutional Responsibility**

NRCA  
PAJ  
MAJ  
SAJ  
SRC  
CAA  
MTW  
AAJ

**Desired Results**

Co-operation with international agencies and development of regulatory framework for waste disposal



## **Goal 2: Conservation of Ocean and Coastal Resources and Ecosystems**

This policy is intended to conserve, protect and enhance Jamaica's ocean and coastal resources, including natural communities and ecosystems, archaeological and heritage sites, and scenic landscapes. The coastal area contains a complex of interacting ecosystems that are among the most biologically productive and environmentally fragile in Jamaica -- these include coral reefs, seagrass beds, mangroves and other wetlands, estuaries and lagoons, beaches and sand dunes, nesting habitat for turtles and sea birds, and other coastal and marine habitats. Given the high societal value placed on coastal resources, and the complexity of the relationships among ecosystems, national and international recognition has been given to the need for special laws and regulations to protect, preserve and enhance these elements of the natural environment.

Specific policy objectives include:

- Establishing an Integrated Coastal Area Management (ICAM) program;
- Improving coastal water quality;
- Establishing programs for the designation and management of parks and protected areas;
- Reducing land-based sources of marine pollution (LBSMP);
- Addressing vessel source pollution (VSP);
- Establishing active systems of enforcement and monitoring of compliance;
- Encouraging voluntary compliance by consciousness-raising campaigns and governmental recognition of achievements by citizens and private entities;
- Increasing opportunities for relevant training and education;
- Protection of endemic, endangered and other valued plant and animal species;
- Promoting pure and applied research; and
- Establishing monitoring programs for natural systems.

### **4.2.1 Pollution**

4.2.2 Sewage Treatment

4.2.3 Solid Waste

4.2.4 Living Resources

### **4.2.5 Parks and Protected Areas**

4.2.6 Ecosystem Management

4.2.7 Cays

- Light Pollution
- Noise Pollution
- Land Filling (Reclamation)
- Natural Hazards

## **4.2 Policy Strategies for Goal 2**

**STRATEGY 4.2.1 – 4.2.3: Improve existing coastal water quality conditions by reduction of point Source and non-point source pollution, sewage treatment and solid Waste**

Poor coastal water quality has adversely affected fisheries, tourism and mariculture, as well as undermining biological sustainability of the living resources of ocean and coastal habitats. Degradation of coastal waters from point source disposal of industrial and domestic sewage effluent and from urban and rural non-point source runoff pose enormous problems that will require major investments in the construction and operation of sewerage systems, improvements in storm water management within urban areas, and application of best management practices to agriculture and forestry in coastal watersheds. Urban planning and development must be coordinated with sewerage infrastructure capacity. A moratorium should be considered for coastal developments lacking adequate area-wide or community-level sewerage treatment systems.

**Actions**

1. Review existing water quality standards and ensure that they reflect ecosystem requirements
2. Upgrade institutional capacity for technical assessment and enforcement
3. Determine biological effects of chemical levels
4. Continue regular assessment of water quality
5. License all entities responsible for effluent discharge into the coastal zone
6. Monitor and reduce effluent discharge
7. Implement method of accountability for responsible agency(ies)
8. Identify gaps in legislation and amend accordingly
9. Establish and maintain sewage treatment plants in all coastal towns and major tourist areas
10. Devise mechanism to motivate people to connect to the sewage system
11. Promote integrated watershed management practices
12. Improve accident response and enforcement
13. Monitor discharge of toxic materials
14. Review enforcement measures for compliance with water quality Standards

**Institutional Responsibility**

NRCA  
WRA  
NWC  
PAJ  
FD  
UWI  
RADA  
MOH  
PC's  
MPM  
SWMA (???)  
MGD  
EHU  
MAJ  
NGO

**Desired Results**

Reduce levels of toxic materials and chemicals in terrestrial run-off.

Reduction of sediment load to coastal waters.

Reduce industrial effluent and sewage discharge to the sea.

**STRATEGY 4.2.4 – 4.2.7: Conservation of living and non-living coastal resources, protected areas and ecosystem management**

The Policy for Protected Areas lists sites that meet the criteria for designation as a National Park, Marine Park, Protected Area, Environmental Protection Area, Scientific Reserve or other type of protected area. However, insufficient funding and the absence of management entities are powerful deterrents to legal designation.

A Jamaica Protected Area Network provides some logistical support and encourages the NGO's currently managing protected areas. The Cartagena Convention's Protocol on Specially Protected Areas and Wildlife, now in force, addresses protected areas and protected species. However, the conservation of fragile ecosystems outside of protected areas also needs to be addressed.

**Actions**

1. Seek to procure adequate funding mechanisms to sustain designated areas
2. Select priority sites for designation as parks, protected areas, scientific reserves, conservation areas on an ecosystem basis, and archaeological and cultural heritage sites
3. Prepare site-specific management plans and site-specific legislation
4. Define access areas and zones
5. Design programs for rehabilitation of damaged ecosystems
6. Identify and monitor priority components of biodiversity
7. Determine and enforce user density limits for parks and protected areas
8. Promote co-management strategies
9. Provide support for the Jamaica Protected Area Network support group and other support groups
10. Promote alternative tourism activities such as eco-tourism, heritage tourism, and archaeological tourism
11. Collect user fees and target these back into the relevant protected area
12. Implement taxes, levies and surcharges for certain permissible activities within protected areas
13. Provide tax incentives to promote the establishment and preservation of protected areas
14. Promote awareness of and the need for preservation of cultural and archaeological heritage sites
15. Monitor introduction of exotic and/or invasive species
16. Develop and promote management plan for protected areas

**Institutional Responsibility**

NRCA  
FD  
FD  
PC's  
TPD  
NGO's  
UWI  
MLE  
IOJ  
JNHT  
Min. of Fin

**Desired Results**

Establishment of priority parks and/or protected areas, with adequate management capabilities and financial support.

Prevent extinction of endemic species, and maintain Jamaica's biodiversity.

Develop alternative tourism activities.

**Goal 3: Baseline data collection and research**

Effective coastal zone management becomes a reality when, as its starting point there is a sound data of the prevalent conditions. It is the baseline data that enables people/agencies to plan out strategies that will

facilitate sustainable management of ocean and coastal resources. Once the baseline data is tabulated the health of the coastal ecosystem can be constantly monitored. The baseline data will enable planners to suggest economically and socially feasible mitigation options that will improve not only the health of Jamaica's coastal zone, but also the well being of present and future generations of coastal communities, particularly those with low incomes. The baseline data will be used as the basis for policy decisions in the future. Repositories of data and information pertaining to coastal resources exist in a number of Caribbean centers; the most prominent of which are the Center for Marine Sciences at UWI, Mona, and the Institute of Marine Affairs in Trinidad. In addition, Hofstra University and the University of Technology in Jamaica are conducting relevant research and training.

Specific objective:

- 4.3.1 Consolidating baseline data for Jamaica's coastal resources as well as socio-economic issues that impact the coastal zone.

### 4.3 Strategies for Goal 3

<p><b>Strategy 4.3.1: Consolidating baseline data for Jamaica’s coastal resources as well as socio-economic issues that impact the coastal zone.</b></p>	
<p>The purpose of this goal is to collect the baseline information and seek to facilitate an understanding of the relationships between key factors in order to identify and prioritize management issues properly. It is to encourage an interdisciplinary analysis of the major environmental, social, and institutional issues and options affecting the coastal area of Jamaica, followed by a decision on the issues that should be addressed.</p>	
<p><b>Actions</b></p> <ol style="list-style-type: none"> <li>1. Characterization of significant habitats, species and biological communities, living and non-living resources and their interrelationships</li> <li>2. Identification of problems that have contributed to unsustainable use of resources and amenities</li> <li>3. Assessment of short and long-term implications of such problems for the environment and society</li> <li>4. Identification of particular areas and conditions that warrant priority within the ICZM program</li> <li>5. Assessment of institutional capability, capacity and credibility for addressing these issues</li> <li>6. Identification of stakeholders for priority ICZM issues, their responsibilities and interests</li> <li>7. Utilizing the knowledge of traditional resource users to contribute to the data network</li> <li>8. Identification of existing sources of information in Jamaica and externally</li> <li>9. Collection and compilation of relevant information</li> <li>10. Identification of institutional deficiencies to manage their own data</li> <li>11. Support on-going efforts to establish a regional marine database at the Center for Marine Sciences</li> </ol>	<p><b>Institutional Responsibility</b></p> <p>UWI CMS NRCA SRC DBML/PRML NGOs UTech JMI</p> <p><b>Desired Result</b></p> <p>Establishing a harmonized data network on coastal zone of Jamaica, which is accessible and transparent. This will include data on socio-economic impacts on Jamaica’s coastal zone.</p> <p>Central on-line database for all coastal and ocean data on Jamaica.</p> <p>Integrated system for data collection and entry.</p>

**Goal 4: Utilizing and integrating the Role of Science and traditional ecological knowledge for Integrated Coastal Zone Management**

Competent management of a complex ecosystem subject to significant human pressure cannot occur in the absence of science. The natural science is vital to understanding the functioning of the ecosystem and the social sciences are essential to comprehend why humans behave in ways that cause ecological problems and can contribute to their solution. In the early years, a key role of science is to isolate the causes of the problem and help eradicate misconceptions and prejudices, so that management effort can focus on the real causes. Approach will be to take time to develop an indigenous cadre of scientists, so that the application of science will continue whether or not foreign scientists are involved. External scientific experience is most useful only after a social and institutional context for integrated coastal management has been established, because science is never applied in a social vacuum and it is not applied effectively unless its application is integrated into the decision-making process.

Scientific techniques and procedures that are particularly useful to integrated coastal management include resource surveys, hazard and risk assessments, economic evaluations and analysis of legal and institutional arrangements. Traditional Ecological Knowledge supplemented by scientific support will provide a selection of ecological monitoring and ecosystem management measures and, in preparing material for public information and education.

Specific policy objectives include:

4.4.1 To utilize the role of science through research in coastal management issues

**4.4 Strategies for Goal 4**

<b>Strategy 4.4.1 To utilize the role of science through research in coastal management issues</b>	
<p>Scientists will work with managers traditional resource users to prepare concise statements of objectives for research and monitoring, clearly defining what is to be measured and why, and in defining methodologies, facilities and personnel needed for the studies to be cost-effective and successful. The policy program should therefore itself fund a portion of the research and monitoring activities carried out within the integrated coastal management area. It is envisaged through the implementation of the policy that as integrated coastal management programs mature, the role of science will evolve from issue identification into helping to develop the needed technologies, and to understanding results of research and monitoring, feedback loops and other interrelationships.</p>	
<p><b>Actions</b></p> <ol style="list-style-type: none"> <li>1. To initiate research early in the program to address the governance process itself and the factors and processes that regulate it</li> <li>2. Institutionalize the role of marine and social science and TEK in the decision-making process</li> </ol>	<p><b>Institutional Responsibility</b></p> <p>COCZM NGOs UWI CMS NRCA MA MLE</p> <p><b>Desired Result</b></p> <p>Integrated system of decision-making</p>

**Goal 5: Provide the Conditions of Governance Required for Effective Integrated Coastal Area Management**

This goal is intended to mobilize legal, financial, administrative, scientific, technological, and human resources in support of programs to ensure that public agencies and community-based organizations receive the funding, information, expertise, and authority to effectively plan and implement a coastal and marine resources management program for Jamaica. This will require a high level of cooperation and coordination between government agencies, an expanded program of education and outreach to the public and to community organizations, and a willingness of the political directorate to pursue new and innovative measures in the areas of inter-agency partnerships, consensus-building in development decision-making, and conflict mediation involving varied stakeholders and interest groups.

In the short-term there is a need to enforce existing legislation to increase compliance with regulations protecting coastal and marine resources. There is also a need to identify gaps in existing legal authorities, and devise new legislation to more effectively pursue integrated coastal area management. Passage of the Natural Resources Conservation Act represented a major advance in resource governance, but the Authority is only one of numerous agencies having jurisdictional responsibility for various aspects of coastal resources management, coastal development, and oceanic affairs. Numerous statutes relate directly or indirectly to the use of coastal resources and activities including fisheries, sand mining, coastal forests, port development, boating and shipping, water sports, natural hazard mitigation, infrastructure development, and the regulation of urban growth.

Institutional arrangements need to be devised to facilitate inter-sectoral integration through inter-agency partnerships. By expanding outreach efforts to stakeholders and community organizations, proactively pursuing net-working arrangements among pertinent government agencies, focusing budgetary resources and personnel on priority programs and projects, and engaging the expertise of the academic and scientific community, there is a real opportunity to break new ground in applying the principles of integrated resource management, urban planning, and economic development to an area of unparalleled importance to the future of Jamaican society.

While existing laws do not preclude the ability of Government agencies to pursue coastal management objectives, there is general agreement that an integrated approach to coastal area management will require a stronger statutory basis than now exists. There are several options including drafting new legislation, amending existing legislation and rationalizing current laws and policies.

Specific policy objectives include:

- Co-ordinating activities of relevant agencies and institutions in pursuit of integrated coastal area planning and management.
- Developing systems, and applying the appropriate technology, to facilitate knowledge sharing and access to information.
- Improving institutional capacity and capabilities by providing adequate staffing and training opportunities in relevant areas.
- Instituting systems of conflict resolution and mediation in coastal area management.
- Maximizing the use of co-management arrangements between Government and civil society.
- Ensuring that there is sufficient legal authority and capability to implement global, regional and bilateral treaties to which Jamaica is a party.
- Foster the implementation of global and regional declarations and plans of action.
- Review and assess adequacy of existing legislation.



- Allocating budgetary and financial resources in accordance with government policy and programme priorities, and appropriating to agencies responsible for program implementation.
- Creation of incentive schemes as a means of encouraging compliance with existing regulations.
- Seek bilateral and regional cooperation to achieve Jamaica's objective of ICZM.

#### **Governance and Capacity Enhancement Issues**

##### **4.5.1 Formal adoption and funding**

4.5.2 Increased opportunities for training and education

4.5.3 Public education, Conservation Mechanisms

4.5.4 Identify and secure adequate sources of funding for parks and protected areas

##### **4.5.5 Exploitation of Protected Marine Resources and enforcement capabilities,**

4.5.6 Minimal Co-management, Inadequate Institutional Capacity, Roles and responsibilities

4.5.7 Law and conflict resolution

#### 4.5 Policy Strategies for Goal 5

<p><b>STRATEGY 4.5.1: Formal adoption and funding</b></p>	
<p>Opportunities for supplementing ocean and coastal resource management budgets need to be more vigorously pursued. Liaison needs to be established and maintained with international resource and development assistance agencies. Well-conceived proposals for partnerships in conducting research, undertaking training, conducting seminars and conferences, and technology transfer generally receive serious consideration by external assistance agencies. These agencies need to be made aware of Jamaica’s intent to pursue a program for integrated coastal area management, and engaged in active dialogue regarding potential areas of collaboration and assistance in funding, personnel exchange, information sharing, and other related areas.</p> <p>Identification of local sources of supplemental funding in support of ocean and coastal programs also needs to be pursued. Discussions should be initiated with appropriate government officials to explore means whereby fees, fines, and other revenues could be retained and/or designated for specific resource management activities or uses.</p>	
<p><b>Actions</b></p> <ol style="list-style-type: none"> <li>1. Identify national programs requiring varying types of assistance including, but not limited to, direct funding</li> <li>2. Establish committee to review opportunities for securing external assistance in support of ocean and coastal management objectives</li> <li>3. Identify relevant resource and development assistance agencies and institutions, and develop strategy for tapping external resources</li> <li>4. Prepare and submit proposals for partnerships and/or other arrangements</li> <li>5. Implement a system whereby the collection of user fees, taxes, fines, levies and surcharges are channeled into the ICZM program</li> <li>6. Provide opportunities for training of personnel in appropriate techniques for sourcing funding</li> </ol>	<p><b>Institutional Responsibility</b></p> <p>MFA NRCA PIOJ UWI UTEC EFJ</p> <p><b>Desired Results</b></p> <p>Securing adequate financial resources for program implementation.</p>

**STRATEGY 4.5.2: Increase opportunities for training and education**

Improve the curricula at all levels to include relevant subjects. Promote distance learning methods; and increase in public awareness programs. Information could be obtained and made available to the public for training and education through the NRCA, the UWI, UTech, or the JMI. A project proposal for the development of a Research Institute has been developed, that will also act as a coordinator for consolidating data on issues related to coastal management. Cognizance should also be taken of opportunities for reciprocal training arrangements with U.S. mainland universities and agencies, Cuba's marine research centers, as well as with European institutions.

**Actions**

1. Ensure appropriate and timely dissemination of relevant information
2. Include relevant subjects at the appropriate levels in school curricula
3. Encourage public participation
4. Utilize various types of media for public awareness programs
5. Promote use of distance education methods as a training tool
6. Promote use of and access to Internet information
7. Support on-going research programs and establish new programs in required areas
8. Establish a Center of Excellence
9. Provide network capabilities between relevant institutions and the Center for Marine Sciences

**Institutional Responsibility**

UWI  
CMI  
NRCA  
Utech  
CMS

**Desired Results**

Strengthen existing training programs.  
  
Improve public awareness and knowledge of ocean and coastal zone issues.

**STRATEGY 4.5.3: Conservation mechanisms and building capacity for integrated coastal zone management in the public and private sector**

Training programs for public and private sector need to be developed and executed which focus on an integrated approach to ocean and coastal zone management. This should not only include basic technical training but also focus on integrated concepts such as watershed management, co-management, and the ridge-to-reef concept. Environmental NGO's with hands-on experience in these areas should be involved in designing the training program where appropriate. The CIDA ENACT Program has already started to build capacity in public sector institutions to incorporate environmental considerations into corporate plans. This strategy can build on that program.

**Actions**

1. Improve existing public awareness/education programs
2. Approach donor agencies for training and technical support
3. Identify capacity needs of specific agencies that will be responsible for training personnel from public and private sector
4. Provide opportunities for training of personnel in specific technical areas
5. Provide opportunities for training of personnel in integrated coastal zone management/watershed management
6. Identify courses and programs suitable for managers and decision-makers
7. Provide opportunities for training in improved decision-making and conflict resolution

**Institutional Responsibility**

NRCA  
UWI  
CMI  
UTEC  
EFJ  
NGO's

**Desired Results**

Adequately trained personnel in areas relevant to integrated coastal area management

**STRATEGY 4.5.4: Identify and secure adequate sources of funding for parks and protected areas**

Although numerous candidate sites have been identified, available funding for active management of parks and protected areas is severely limited. Park and protected area management, including construction of visitor facilities, usually requires external funding. Long-term sustainable operation calls for the preparation of a financial strategy that, in addition to direct donor assistance, assesses operational costs and potential revenue flows from user fees and other charges.

<b>Actions</b>	<b>Responsible Institution</b>	
1. Government to allocate a specific amount from the budget for parks and protected areas	EFJ UWI NRCA MLE MA NGOs	
2. Investigation of possibilities for public-private partnerships both nationally and internationally		
3. Encourage community participation in providing skills and services		
4. Perform economic valuation of existing and proposed protected areas and biodiversity		
5. Establish Trust funds for Parks and Protected Areas		<b>Desired Results</b>
6. Fundraising from international donors (multi-lateral donors such as GEF, IDB, OAS; bilateral donors, international NGOs (such as WWF,); bilateral donors such as USAID, CIDA, ODA; philanthropic foundations; corporations and individuals)		Yearly government budget allocation
7. Utilize taxes, fees, fines and penalties to support protected area programs and operations		Utilize existing available international and national sources of funding
	Provide financial sustainability for conservation of resources	

**STRATEGY 4.5.5: Strengthen statutory framework and improve enforcement capabilities**

There are several pieces of legislation in relation to coastal zone management but there is little in place to support ICZM. A weakness in the system is the lack of enforcement of existing legislation and minimal fines and penalties that fail to act as effective deterrents. Programs such as the NRCA Game Wardens could be expanded by active recruitment of volunteers. Selected stakeholders could be recruited to enforce existing legislation, as appropriate, in their area.

**Actions**

1. Empowerment of relevant stakeholders to enforce existing legislation as appropriate
2. Expansion of the current warden system
3. Increase fines and penalties
4. Environmental sensitization of judiciary, constabulary force and defense force

**Institutional Responsibility**

NRCA  
JCF  
JDF  
AGD  
DPP  
CPC  
Law Reform

**Desired Results**

Reduction in crimes that impact the ocean and coastal zone

**Strategy 4.5.6: Enhancing co-management, institutional capacity, roles and Responsibilities**

The role of the Council is to oversee the activities for the management of the ocean and coastal resources. The Council should set priorities, plan and formulate its agenda for the future.

The strategic agenda should express the Council's mission as a set of concrete short- and long-term goals and funding objectives. The goals should be designed to reflect a coherent program based on a strong sense of purpose, the effective use of resources, and recognition of the Council's special and critical capacity to improve coastal management and results.

**Actions**

1. Develop innovative, specific projects with high impact on the mission of the Council
2. Identification of opportunities and/or gaps where tangible new projects can be demonstrated and created
3. Encourage innovation, evaluate the effectiveness of projects, and raise and sustain public awareness of results they produce
4. Engage Council members more actively in the business of the Council and in specific project work in order to build infrastructure that creates a stronger sense of membership
5. Develop partnerships with other NGOs to identify and disseminate best coastal management practices
6. To establish a clear legal basis for the Council
7. To establish an operational budget for the Council

**Institutional Responsibility**

COCZM

**Desired Results**

Enhancement of government's functions in promoting sustainable use and management initiatives, of coastal resources.

Promoting public understanding and support for the key issues of sustainable development of coastal resources.

Organizing public, private, and non-profit partnerships, which champion the management of coastal resources as a leadership resource for government.

An integrated cooperative approach to ICZM

**Strategy 4.5.7: Law and Conflict Resolution**

On the adoption of the integrated coastal management program, its institutional identity will need to be granted by legislation. Before seeking resolutions of a dispute through a court interested parties should be encouraged to use alternative dispute resolution mechanisms.

**Actions**

1. Define responsibilities for planning and implementation
2. Define legal provisions for NGO advocacy for nature and its non-human compartments
3. Apply rules that govern alternative dispute resolution procedures
4. Legislation to provide for referral to alternative dispute resolution in specific categories of cases
5. Provide for funding mechanisms to make alternative conflict resolution processes available to interest groups that lack the financial means to participate
6. Provide training and education for outside parties to mediate/facilitate/arbitrate in disputes, with schemes and guidelines for the recognition of qualified mediators/facilitators/arbitrators
7. Provide incentives to encourage parties to negotiate

**Institutional Responsibility**

COCZM  
AGD  
CPC  
ADRF

**Desired Results**

Organize amicable dispute resolution mechanism



## **5.0 INSTITUTIONAL FRAMEWORK FOR POLICY IMPLEMENTATION**

### **5.1 Introduction**

The adequacy of the institutional base is a key consideration in effective coastal and ocean resources management. The existence of national institutions with clear mandates and capabilities is essential for successful management of a country's resources. There is some debate about whether such clear mandates exist in Jamaica. *One issue is how to best proceed with existing mechanisms in the short-run, while devising improved measures for the intermediate and longer-term.*

A strong case can be made for devising legislation that specifically addresses the management of coastal and marine resources. On the other hand, there appears to be a sufficiently sound statutory basis for Jamaica to move forward in developing and implementing programs that advance the twin goals of (1) promoting sustainable economic development and (2) conserving ocean and coastal resources and ecosystems. Nevertheless, a key issue remains: *Whether new legislation will be required to resolve the diffusion of agency responsibilities and jurisdictional overlaps if Jamaica's coastal and marine resources are to be effectively managed.*

In many countries the fragmentation of authority between government agencies is frequently cited as bedeviling coastal resource management. Complexity in ministerial and departmental roles and authority, overlapping mandates and uncertainty as to clear divides between agency responsibilities is a problem that is generic to government, and one that seems unlikely to ever being definitively resolved. Despite this, short-term solutions are invariably found if the political will exists. Problems can be dealt with incrementally. Innovative arrangements can be devised that respond to particular situations. Often, the experience gained creates the basis for articulating new policies and for structuring new legislation.

But no single law or statute will cover every contingency. Integrated coastal and marine resource planning and management is inherently multifunctional, cross-jurisdictional and interdisciplinary. Effective coastal management will continuously require coordination, cooperation, and innovation among the principal agencies and stakeholders in dealing with the dynamics of change: Changes in development and trade relations, demographic shifts and migration, responses to new interpretations of global phenomena, and the consequences of unforeseen and unforeseeable disasters whether natural or made-made.

### **5.2 Government Agencies**

While there are acknowledged institutional complexities in assigning clear-cut roles and responsibilities for some aspects of coastal area planning and management, there are aspects that clearly fall within the mandate of specific government agencies and statutory bodies. Key agencies and principal functions relating to coastal area management are listed below. The major roles and responsibilities include regulatory, management, training and development. Many agencies have more than one role. Appendix A lists relevant government agencies.

### **5.3 Parish Councils**

It is essential to strengthen the capabilities of Parish Councils in order to ensure that coastal resources are being adequately managed locally. While the Councils currently lack the necessary funds and personnel, they do have the potential to play a significant role in the future, particularly in overseeing the operation of local recreational and fishing beaches, as well as working with community organizations and NGOs in monitoring and enforcement activities. Local solid waste management is an additional activity that Parish Councils could assume. The success of the ODPEM in working with the Parishes on hurricane protection and disaster response is a hopeful indication of what might be accomplished with appropriate resources and training.

## **5.4 Civil Society**

Government does not always have the resources and flexibility to implement and manage all programmes and activities. For this reason it is vital to enlist community volunteers, as is currently done with the Game Warden system. Local eyes provide the most effective enforcement guarantees, particularly if those same eyes have participated in programme decision-making. Co-management as a management tool can be very effective and involves decision flow from the bottom up as well as from the top down, and co-operation between government agencies and civil society.

Civil society includes Environmental Non-governmental Organisations (ENGO's), Community-Based Organisations (CBO's), Professional Societies and Service Groups. The National Environmental Societies Trust is the umbrella organization for ENGO's. The ENGO movement in Jamaica has grown considerably in numbers and in strength within the last five years and is recognized as a creditable force. The existing parks and/or protected areas are currently managed by ENGO's under the NRCA's regulation. Some professional organizations and service groups have an environmental committee, which is active. Appendix C lists some of the relevant civil society groups.

## **5.5 Private Sector Organizations**

Key industries in Jamaica depend upon ocean and coastal resources, and the availability of coastal infrastructure facilities such as port and harbor installations. The construction industry requires sand for concrete. Dive operators require healthy marine habitat and sediment-free water. Tourism-related industries and businesses such as hotels, tour operators, and even the airlines need a healthy tourism sector to survive and prosper. These industries, directly or through their trade organizations, represent important stakeholders whose views and interests need to be considered in management planning for ocean and coastal resources. Conversely, such groups have a responsibility to contribute to resource sustainability, and to the ability of Government to effectively manage the resources that are in the public domain. It is essential that partnership relationships, both nationally and locally, be established between relevant Government organizations and private sector groups such as the Jamaica Shipping Association, the Jamaica Hotel and Tourist Association, and the Private Sector Organization of Jamaica (PSOJ), among others. The latter organization is an umbrella group that operates on behalf of its membership organizations, and currently has an active Environmental Committee.

## **5.6 Academic and Research Community**

The main academic institution involved in ocean and coastal zone management research is the University of the West Indies. There are several departments that have programmes at both the under-graduate and post-graduate level. These include the Department of Life Sciences (fisheries, biodiversity, coral reef management, marine ecology, aquaculture, coastal zone management, plankton, pollution studies and algal ecology); Discovery Bay Marine Laboratory and Port Royal Marine Laboratory (supporting teaching and research facilities for various departments and overseas institutions); Department of Chemistry (environmental chemistry, pollution); Sir Arthur Lewis Centre (social sciences); and the Departments of Geography and Geology. The Jamaica Maritime Institute specifically does training at the tertiary level in maritime affairs. The main academic and research institutions are listed below. Appendix D lists the relevant academic institutions.

## **5.7 Intergovernmental Organizations**

The opportunities available from intergovernmental agencies should be maximized. Many of these agencies provide funding and training specific to ocean and coastal zone management, or are able to access funds on behalf of national agencies. These organisations include the International Seabed Authority (ISA), the Inter-American Development Bank (IDB), the Caribbean Health Institute (CEHI), THE Caribbean Agricultural Research Development Institute (CARDI,) and the following UN agencies and organizations: Food and Agricultural Organisation (FAO), the Pan-American Health Organisation (PAHO), the United Nations Development Programme (UNDP), and UNEP's Caribbean Environment Programme (CEP) Regional Co-ordinating Unit.



## 6.0 LEGAL FRAMEWORK

### 6.1 National Legislation, Regulations and Supplementary Guidance

#### A KEY ISSUE AFFECTING GOVERNANCE

Do the existing government organizations have the necessary legal instruments and regulatory authority to respond to the issues that are being faced in coastal and marine resources management?

While many of Jamaica's existing laws, regulations, and guidelines are relevant to the management of ocean and coastal resources, many others are outdated and/or redundant.

Over fifty pieces of existing national legislation, regulations and guidelines pertaining to the terrestrial environment, watersheds, the coastal zone, and the open sea have been identified. The legal and institutional framework for integrated coastal area management in Jamaica, therefore, appears to be fragmented, potentially inconsistent and possibly incomplete. The process of distilling this material into a coherent national policy statement remains to be done. It is the intent of the Council, through this present endeavor, to develop such a policy, leading to the preparation of a Green Paper and, eventually to a White Paper addressing coastal and ocean resource management.

A compendium of these legal and quasi-legal instruments is listed below. At issue is the direction to be pursued: Seeking new legislation, the amendment of existing laws and regulations, repeal of redundant statutes or the consolidation of existing laws and regulations into a more coherent package. This policy is not meant replace other existing sector specific policies, but is cognizant of these policies, the linkages between them, and ocean and coastal zone issues.

#### 6.1.1 National Laws

From the standpoint of current coastal area management activities, the two most readily utilized pieces of legislation are the Beach Control Act and the Natural Resources Conservation Authority Act.

##### Beach Control Act

This Act was promulgated in 1956 and vests all rights in and over the foreshore and the floor of the sea in the crown. Any use of these areas except for rights acquired under the act is subject to a license from the Natural Resources Conservation Authority, which is the body now, administering the Act. Though this Act is dated, there is provision for protected areas. Section 7 grants the Minister discretionary power to declare, upon the recommendation of the Natural Resources Conservation Authority, any part of the foreshore or the floor of the sea together with the water lying on such part of the floor of the sea to be a protected area. The purposes for protection though somewhat limited but useful. The activities listed are: fishing by any means; the use of boats, other than boats propelled by wind or oars; the disposal of rubbish or any other waste matter; water skiing, the dredging or disturbance in any way of the sea floor; the destruction or removal of coral, sea fans and sedentary marine animals and the searching for or removal of any treasure or artifact from the floor of the sea. The Act also provides for the declaration of public bathing beaches and procedures relating to public rights of access.

### NRCA Act (1991)

This Act establishes the Natural Resources Conservation Authority (NRCA) and provides for the management, conservation and protection of the natural resources of Jamaica. It is an umbrella type environmental legislation that represents a paradigm shift from traditional sectoral environmental applications, and focuses on an ecosystem approach to the management, conservation and protection of natural resources. In an effort to achieve this overall goal, the Act seeks to co-ordinate the efforts of all agencies and departments of government that carry out any function similar to those of the Authority. It provides for mandatory consultation with the Authority. . The functions of the Authority include the taking of such steps that are necessary to ensure the effective management of the physical environment of Jamaica, the management of marine parks and protected areas.

### The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order, 1996 and The Natural Resources (Permits and Licenses Regulations)

Both the Order and the regulations were passed pursuant to Section 9 of the NRCA Act. The Order provides that the entire island of Jamaica is prescribed area and lists specified categories of enterprise, construction or development that require a permit and for which Environmental Impact Assessments may be required. Those relating directly to the conservation of marine resources include; port and harbor developments, and modification, clearance or reclamation of wetlands. Sewage effluent is addressed separately under the Act and provides in Section 12, that no person shall discharge on or cause or permit the entry into water, on the ground or into the ground any sewage, trade effluent or any poisonous, noxious or polluting matter. However, certain activities are exempt from this section. These include discharges, which are in accordance with good agricultural practices, discharges permitted in an emergency in order to avoid a greater danger to the public or discharges from domestic waste effected by means of absorption or soakaway pits or other prescribed waste disposal systems.

### The Morant and Pedro Cays Act (1904)

The Morant and Pedro Cays Act establishes licensing conditions for these offshore cays and; prohibits unauthorized fishing and the removal of birds and turtles, and their eggs.

### Wild Life Protection Act (1945)

Though the objective of the Act is the protection of wildlife, it is primarily concerned with the protection of specified species of fauna. It prohibits the removal, sale or possession of protected animals, use of dynamite, poisons or other noxious material to kill or injure fish, prohibits discharge of trade effluent or industrial waste into harbors lagoons, estuaries and streams. The Act also allows for the declaration of Game Sanctuaries and Reserves.

### The Mining Act (1947)

This Act gives the Commissioner of Mines the responsibility to exercise general supervision over all prospecting and mining operations in the island.

### The Tourist Board Act (1955)

The general mandate of this Act is to develop all aspects of the tourist industry and to promote its efficiency, and to encourage measures for development of amenities to enhance the attractiveness of Jamaica to tourists. This Act is executed by the Jamaica Tourist Board.

### The Tourist Board Regulations

### Town and Country Planning Act (1958)

The Act Establishes the Town and Country Planning Authority, which has as its major responsibility as overseeing the orderly development of Jamaica. Included in its for Development Orders to control both rural and urban land development, ensure proper sanitary conveniences, co-ordinate building of roads and other public services.

### Land Development and Utilization Act (1966)

Provides for the regulation of idle lands, terms of leasing and the disposition of agricultural lands.

### Urban Development Corporation Act (1968)

The Urban development Corporation is entitled to acquire, manage and dispose of lands, construct roads, provide public amenities. Though the Act speaks to the preservation of sites and objects of architectural or historic interest there is no reference to environmental considerations.

### Port Authority Act (1972)

The Port Authority Act is responsible under the Act for the development and regulation of port facilities which include structures for the safe navigation, berthing and loading and off loading of cargo. Dredging, construction and reclamation of coastal land are activities carried out by the Port Authority pursuant to its statutory functions.

### Public Health Act (1974)

This Act provides for standards and enforcement for domestic water consumption, waste disposal and monitoring of water used for drinking, bathing, washing and cooking. A regulation under this Act includes those relating to nuisances and regulates behavior at pools.

### Fishing Industry Act (1975)

This Act is related to the regulation of the fishing industry and serves to conserve and manage the fisheries resources by addressing issues such as licensing of fishers. It also gives the Minister the power to make regulations with respect to use of fishing equipment, methods of fishing, marketing of fish, management and control of fishing beaches and measures for conservation of fish. A comprehensive approach to fisheries management is to be reflected in the proposes new Fisheries Bill.

### The Harbors Act (1976)

The Harbors Act provides for the declaration of the harbors in Jamaica, and the appointment of a harbor master with general authority to regulate the safe movement of vessels within the harbor limits and to maintain aids to navigation. The Act makes the discharge of noxious matter from vessel into the harbor a criminal offence. The Harbors Act authorizes the Port Authority to declare, establish or alter the boundaries of harbors. The Port Authority has ultimate management responsibility for all harbors in the island.

### The Quarries Control Act (1983)

This Act repeals the Quarries Act of 1958 and makes provisions for quarry zones and licenses, quarry tax, enforcement and safety.

### National Heritage Trust Act (1985)

This Act provides for protection of areas, structures and objects of cultural significance to Jamaica by declaration of any structure as a national monument where preservation is of public interest due to historic, architectural, traditional, artistic, aesthetic, scientific or archaeological importance. This includes the floor of the sea within the territorial waters or the Exclusive Economic Zone.

#### Litter Act (1986)

This Act seeks to control littering in public and private places. Litter is broadly defined to include refuse; animal remains as well as noxious or offensive liquids. The Act is administered by the local Parish Councils and for the corporate area; the Kingston and St. Andrew Corporation. A *Solid Waste Management Act* is scheduled to come on stream in the near future and proposes to address solid waste in a comprehensive manner.

#### Watersheds Protection Act (1963, incorporated into NRCA Act of 1990, currently under review)

The Watershed Protection Act is primarily concerned with the conservation of water resources and the necessary protection to be afforded to those areas, which constitute or adjoin the watersheds of the island. Given Jamaica's small size and the river systems, the island has been divided into 11 watersheds. The Authority has discretion to make regulations for ensuring the proper, efficient and economic utilization of land within a watershed with a view to promoting the conservation of water resources. There have been no regulations to date. Though the object of the Act appears to be very focused, in that all activities to be carried are in pursuance of the conservation of water resources, it provides a useful tool in the conservation of marine resources.

#### The Exclusive Economic Zone Act (1991)

The Exclusive Economic Zone (EEZ) Act seeks to preserve and protect the marine environment and to prevent and control marine pollution. The Crown has sovereign rights regarding exploration, exploitation, conservation, protection and management of all natural resources of the waters over the seabed and sub-soil.

#### The Jamaica Maritime Institute Act (1992)

This Act established the Jamaica Maritime Institute, the functions of which are to provide training for persons employed in the shipping industry, shore-based shipping industries and associated industries, and to provide a resource center for the maritime industry with a view to the development and maintenance of a vibrant shipping industry in Jamaica.

#### Water Resources Act (1995)

Established the Water Resource Authority and authorizes the Authority to regulate, allocate, conserve and manage the water resources of the island.

#### The Pesticides (Amendment) Act (1996)

This Act of 1996 amended sections of the principal act, which came into effect in 1975 and established the Pesticides control Authority. This Act gives the Authority the responsibility of controlling the importation, manufacture, packaging, sale, use and disposal of pesticides.

### The Maritime Areas Act (1996)

The Maritime Act replaced the Territorial Seas Act, which originally established for Jamaica a 12-mile territorial sea. The Maritime Act declares Jamaica to be an archipelagic state and merely defines the various maritime zones. The Act however may be defined as a framework within which the Minister may, subject to his regulatory powers under Section 28, create more substantive provisions to carry out the true intent of the Act. There is no provision that currently specifically addresses the conservation of marine resources, though the regulatory provisions provide that the Minister may make regulations for the preservation and protection of the marine environment and the prevention and control of marine pollution; and the conservation of living resources in the internal waters, archipelagic waters, territorial sea, contiguous zone and continental shelf.

### Forest Act (1996)

This Act replaces the old Forest Act and lists the functions of the Forestry Department to include; the sustainable management of forests in Crown lands or in forest reserves, and the effective conservation of those forests; *directing* and controlling in a rational manner the exploitation of forest resources by the introduction of adequate systems for renewal of those resources; preparing and implementing a national forest management and conservation plan; and promoting the development of forests on private lands. Every five years, the Conservator of Forests is mandated to prepare a forest management plan for the Minister's approval. The Forest Plan is to be revised within any period not being more than five years Empowers the Minister to declare Crown lands or private lands (if the owner so desires) to be forest reserves.

### The Shipping Act (1998)

This Act to make better provision in respect of the regulation of merchant shipping, and in respect of the registration of ships, the employment and certification of seafarers, the safety of shipping, to significantly consolidate the law relation to and to make provision for connected matters. Regulations pertaining to ship source oil pollution are being prepared. The Act establishes the Maritime Authority with responsibility *inter alia* inspecting ships for the purpose of marine pollution prevention and makes provisions for the incorporation of international conventions on the prevention of pollution of the marine environment.

### The Office of Disaster Preparedness and Emergency Management Act (1998)

This Act established the Office of Disaster Preparedness and Emergency Management (ODPEM) to develop and implement policies and programs to achieve and maintain an appropriate state of national and sectoral preparedness for coping with emergency situations. Under the Act disaster is defined to mean A the occurrence or threat of occurrence of an event caused by an act of God or otherwise, which results or threatens to result in *inter alia*, damage to property, damage to the environment on a scale which requires emergency intervention by the state. Disaster preparedness includes an activity undertaken in anticipation of a disaster, hazard or other emergency situation. Though this Act is very general in its application, the Office of Disaster Preparedness and Emergency Management in conjunction with the Natural Resources Conservation Authority has formulated guidelines for disaster relief and response pursuant to. Jamaica is a member of the Caribbean Island Oil Pollution Preparedness Response and Co-operation Plan. This is a tiered response procedure designed to assist island states and territories within the region with oil pollution incidents that are beyond their capacities.

### Endangered Species (Protection, Conservation and Regulation of Trade) Act (2000)



This Act was promulgated to ensure the codification of Jamaica's obligations under the Convention for the International Trade in Endangered Species of Wild Fauna and Flora. The Act provides for the management of endangered species of Wild Fauna and Flora and for the regulation of trade. More specifically, it makes provisions for the importation and exportation of specified species of wild fauna and flora consistent with the requirements of the Convention and incorporates a controlled permitting regime relating to the importation and exportation of wild fauna and flora. Flora and Fauna endemic to or found in Jamaica that are not included under the CITES Appendices but which require protection are listed under Appendix IV.

#### Local Improvements Act

Requires that anyone wishing to subdivide land for building, lease, sale or other purpose must provide the local planning authority with a plan for approval.

#### **6.1.2 Declarations and Orders**

##### Beach Control Order (Black Coral)(1979)

This order declares the entire foreshore and the floor of the seas (within the limits of the territorial sea of Jamaica) together with the water lying on that part of the floor of the sea, to be a protected area.

##### Natural Resources (Montego Bay Marine Park Order (1992) and Natural Resources (Marine Parks) Regulations

These regulations were enacted pursuant to Section 38 of the Natural Resources Conservation Authority Act. The object of the Order is to establish a marine protected area, primarily for the purpose of conserving the natural resources within the area. The regulations apply to all marine protected areas in which the following activities are prohibited; extraction or mining of minerals, the destruction, injury defacing, removing, digging, harmfully removing or disturbing any sand, gravel, minerals, corals, sea fans, shells, shell fish, or other marine invertebrate, seaweeds, grasses, soil rock, artifacts, stones or other materials. No person shall use, sell or otherwise dispose of the aforementioned knowing it to have been unlawfully removed from a marine park. The regulations also prohibit the discharge or deposit of any refuse, oily liquids, or wastes, acids or other deleterious chemicals or toxic or polluting substances of any kind which may be injurious to plant or animal life. In or on waters of a marine park Fishing without express permission is prohibited. With respect to fishing, the Authority is vested with a discretion to declare specified areas of a marine park to be no fishing zones, or where fishing is allowed, to specify the kind of fish which may be caught or the kind of fish in respect of which fishing is prohibited, or may establish individual quotas and fishing equipment that may be used. The Authority also has discretion to zone a marine park.

##### Natural Resources Conservation (Blue and John Crow Mountains National Park) (Declaration) Order (1993) and the Natural Resources National Parks Regulations.

The Order establishes the Blue and John Crow Mountain National Park while the regulations govern activities within all national parks. Included in the regulations are provisions pertaining to the control of animals, littering, pollution of lakes and streams, use of poisons, disorderly behavior. The act also provides for the designation of camping areas, restrictions on the use of fires, commercial activities, mining and research, etc. Zoning, monitoring and enforcement are also addressed.

##### The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order (1996)

The island of Jamaica and the Territorial Sea of Jamaica has been declared as a Prescribed Area. No person can undertake in Negril any enterprise, construction or development of a prescribed description of category except under and in accordance with a permit.

### The Town and Country Planning Coast Confirmed Development Orders

The intention of the orders is to make provision for the orderly development of the Island's coastline. The Orders are undoubtedly old, the first having been declared in 1959. The orders however do not place much emphasis on tourism development and the development of social amenities. There is therefore no mention of development in light of the conservation of marine resources. Later development orders however do reflect concern for marine resources. The Town and Country Planning (Trelawny Parish) Provisional Order 1980 addresses marine areas as one category that requires special planning considerations. The Order specifically addresses coastal erosion, pollution, and water borne effluent and mining, quarrying and sand deposits. Under marine areas, the Order declares that severe coastal erosion and deleterious alteration to the marine environment by natural and artificial means requires the control of development which might affect the coast and coastal waters and to repair the damage which is now evident or imminent. It then refers to the need to effect coastal modification works like groynes in an effort to help build back the sand and protect inshore reefs.

In recognizing that pollution poses a serious problem to marine resources states that coast and coastal waters are to be protected against pollution by control of adjoining development. Development proposals are to be examined with regard to prevention or control of pollution. Careful monitoring of coastal waters is necessary for the cleanliness of the environment as a public health matter, and to maintain the high amenity of the inshore water used by increasingly greater numbers for recreation. This is particularly so where effluent might enter coastal waters by dumping or seepage. In addressing sand mining Section 10 of the order recognizes that though sand stealing is prevalent due to the absence of a natural supply of building sand elsewhere, it cannot be regarded as a source for extraction purposes. Since offshore sand deposits are not extensive and their rate of natural replenishment cannot compete with the current rate of removal, any extraction of any material constitutes development for which planning permission is required.

#### **6.1.3 Policies**

##### Mangrove and Coastal Wetlands Protection - Draft Policy and Regulations (April 1996)

The document reviews the issues affecting wetlands in Jamaica as well as the Government's role and responsibility. Five main goals are outlined. These are guidelines for wetland development, cessation of destructive activities, maintenance of natural diversity, maintenance of wetland function and values and integration of wetland functions in planning and development.

##### The Natural Resources Conservation (Portland Bight Protected Area) Regulations 2000 (Draft)

These draft regulations seek to regulate certain activities with the Portland Bight for application within the area declared to be the Portland Bight Protected Area, and applies in addition to any other regulations relating to the said area. Regulations cover aspects such as beaches, fisheries, protected species and developments.

##### National Policy for the Conservation of Seagrasses (1996)

This policy recognizes the value of seagrasses to marine ecosystems and seeks to regulate and guide the issuing of licenses, or permits for activities such as dredging, disposal of dredge spoil, beach development and effluent disposal, which directly or indirectly affect seagrass communities.

##### Policy for Jamaica's System of Protected Areas (1997)

The Policy formulated pursuant to Section 5 of the Natural Resources Conservation Authority Act, describes the protected areas system as having a common underlying foundation of environmental protection purposes, and a standardized approach to planning and management. It is a useful tool in the employment of ICZM as a management model. The policy defines a protected area as an area of water or land that is managed for the protection and maintenance of its ecological systems, biodiversity and/or specific natural, cultural or aesthetic resources. It is envisaged that the system will be an essential tool for environmental protection, conserving essential resources for sustainable use, helping to expand and diversify economic development and contributing to public recreation and education. The need for community based management or local co-

management programs and sustainable management programs are also emphasized. The goals of the protected areas system are expressed as economic development, and environmental conservation. Types of protected areas include marine parks; habitat species management areas; National Protected landscape/seascape; and managed resource protected areas.

Towards A Beach Policy For Jamaica (A policy for the Use of the Foreshore and the Floor of the Sea) November 2000. (Draft)

Though the policy specifically addresses the controversial issue of beach access, it addresses issues relating to oil pollution, sewage pollution, solid waste disposal, beach erosion, coastal water quality, mariculture and wild life protection. Oil Pollution is to be addressed by the National Oil Spill Emergency Plan administered by the Office of Disaster Preparedness and Emergency management, The Jamaica Defense Force and the Natural Resources Conservation Authority. Sewage Pollution may be addressed by the development of community based disposal systems for example aeration ponds and polishing beds. Any system developed should ensure that effluents are discharged at points, which will result in minimal or no effect on the coastal zone. The proposed Solid waste management Act will now address solid waste disposal. Beach Erosion is oftentimes the result of illegal sand mining and public education and general law enforcement may address illegal sand mining. With reference to Wildlife Protection, the document acknowledges that many of Jamaica's beaches and offshore cays are nesting sites for turtles, sea birds and other animals, some of which are endangered. The policy therefore proposes that measures be implemented to prevent or reduce any threat to wildlife and their habitats.

Coral Reef Protection And Preservation Policy And Regulation, October 1997 (Natural Resources Conservation Authority) (Draft)

The policy recognizes that coral reefs are among the earth's most biologically diverse, oldest and species rich ecosystems. The aim of this policy is to ensure the conservation of coral reefs in order to sustain their ecological and socio-economic functions. It proposes to achieve this aim by (a) reducing the quantity of pollutants being released to the coastal environment (b) reversing the trend of over fishing by more stringent regulation of the fishing industry (c) reducing the physical damage to reefs as a result of recreational boating, souvenir hunting, spear fishing, dynamiting and other activities; (d) improving the response capability for addressing oil and other chemical spills; and (e) regulating coastal zone development which contributes to coral reef destruction and or degradation. The implementation of the policy is to be guided by given principles. These include an integrated coastal zone management approach to ensure an acceptable balance between conservation and development objectives; a co-management approach and public education.

Mariculture Draft Policy and Regulation.

The Draft Policy sees mariculture as an opportunity to provide a sustainable supplement or an alternative to marine capture fishery. The need for an alternative arises due to the fact that uncontrolled harvesting of fish, pollution, and the destruction of mangroves and coastal wetlands has severely depleted shellfish stocks, especially the mangrove oyster. The policy therefore aims to support and encourage the managed use of the nation's marine resources, to raise the output of marine food products for domestic consumption and for export, and to generate local employment in communities that have traditionally relied on the sea for economic sustainability. The policy is consistent with the government's development objectives, and is expected to be carried out within the framework of an integrated coastal zone management plan for Jamaica.

#### Towards A Watershed Policy for Jamaica (1999)

This policy, in advocating the employment of watershed management as an environmental management model for Jamaica, provides for an integrated approach to protection conservation and development of land and water resources for their sustainable use and for the benefit of the nation as a whole. It gives an overview of watershed problems, past interventions, current international trends in watershed management, and highlights major challenges to be faced in watershed management as well as key principles and strategies being employed by the policy to address these challenges.

#### National Forest Management and Conservation Plan (2000)

This Plan made pursuant to the Forest Act aims to promote and improve the conservation and sustainable use of the forest resources to meet local and national needs through protecting, managing and restoring resources.

#### Towards a National Strategy on Biological Diversity in Jamaica (Draft)(2000)

The development of the National Strategy on Biodiversity and the supporting Action Plan are requirements of the Convention on Biological Diversity which has been ratified by Jamaica. The Strategy outlines plans and programs for the sustainable use of Jamaica's biodiversity.

#### **6.1.4 Guidelines**

##### NRCA Guidelines for the Deployment of Benthic Structures (1996)

These guidelines cover the definition of benthic structures, site selection, environmental impacts related to structure deployment and licensing requirements.

##### NRCA Guidelines for Environmental Impact Assessment (1998)

Section 10 of the NRCA Act gives the NRCA the discretion to request of any applicant for a permit or a license under Section 9 of the Act, an Environmental Impact Assessment. To facilitate the process the NRCA developed guidelines for conducting EIA's which includes a definition of an EIA, the EIA process, reporting and review procedures.

##### NRCA Guidelines for Development in the Coastal Zone in Jamaica (1998)

This document serves as a guide for actions to be taken and the relevant agencies to be consulted for development in the coastal zone. It gives an idea of potential environmental impacts resulting from certain development activities and guides mitigation measures; and reviews the requirements for permits, licenses and environmental impact assessments.

##### NRCA Guidelines for the Planning and Execution of Coastal and Estuarine Dredging Works and Disposal of Dredge Materials

These guidelines provide information on the permitting process and the engineering and environmental aspects of projects involving capital works dredging and maintenance dredging.

##### NRCA Guidelines Pertaining to Marinas and Small Craft Harbors

These guidelines focus on the environmental aspects of marinas and small craft harbors and are aimed at those responsible for site selection, the design, construction and operation of marinas. The objectives are to enable the establishment of berthing areas for small craft while preserving coastal resources and beauty.

##### NRCA Guidelines for Construction, Maintenance and Monitoring of Underwater Pipelines and Cables in the

## Coastal Zone

These guidelines provide information on the permitting process and engineering aspects of projects involving pipelines and cables in the coastal zone. These include pipelines for fuel oil and other petroleum products, sewage effluent and freshwater; and cable for telecommunications and electricity.

### NRCA Guidelines related to Management, Operations and Financial Plans

These guidelines provide direction to planners in the development of Management, Operations and Financial Plans for a Protected Area. Provides direction in the process of planning, in the development of management strategies and in the preparation of planning documents.

### NRCA Guidelines related to Management of Protected Areas of Jamaica

This guideline describes the policies used by the NRCA for the protection of habitat for native plant and animal species, for perpetuating the island's biodiversity through management of protected areas, and development of environmentally sustainable uses of natural resources within these areas.

### NRCA Guidelines for the Planning, Construction and Maintenance of Facilities for Enhancement and Protection of Shorelines

These guidelines offer guidance on the permitting process, environmental aspects and coastal engineering planning and design of projects related to protection and enhancement of shorelines.

### NRCA Handbook for Development in the Coastal Zone of Jamaica

Gives physical planners an appreciation of the coastal and marine resources that must be included in integrated planning. Reviews major coastal ecosystems and how they are impacted by development.

## **6.2 International Commitments: Treaties and non-binding international instruments**

Numerous international, regional and bilateral treaties relate to the planning and management of ocean and coastal resources. Many of these treaties address similar or related issues and as such there is a need for coordination regarding the implementation of the provisions of the various treaties relating to coastal and ocean resources. Jamaica is a party to several of these treaties as indicated below by an asterisk.

### **6.2.1 *International Conventions***

#### **International Convention for the Prevention of Pollution of Ships, 1973 as amended by the Protocol of 1978 (MARPOL)**

This is the most important global treaty for the prevention of pollution from the operation of ships. It governs the design and equipment of ships, establishes a system of certificates and inspections, and requires states to provide reception facilities for the disposal of oily waste and chemicals. It covers all technical aspects of pollution from ships except for the disposal of waste into the sea by dumping which the London Convention covers. It does not apply to pollution arising out of the exploration and exploitation of seabed mineral resources. Jamaica is a party to this Convention.

### **Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London 1972**

The Convention seeks to prevent the pollution of the marine environment by the discharge of waste generated on land into the sea. It speaks to the carriage, disposal and reception of such waste. It prohibits the dumping of certain harmful substances and permits the dumping of others under strict control only if certain conditions are met. Jamaica is a party to the Convention.

### **Protocol to the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1996**

This Protocol has not yet entered into force but it will replace the London Convention when it does. It prohibits the dumping of radioactive wastes or other radioactive matter and of industrial wastes. It also prohibits the incineration at sea of industrial wastes and of sewage sludge. Jamaica is not a party to the Protocol.

### **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Basel 1989**

The Convention regulates the transboundary movements of hazardous wastes and obligates States to ensure that such wastes are managed and disposed of in an environmentally sound manner. The Convention seeks to control the transboundary movement of hazardous wastes, monitor and prevent illegal traffic, provide assistance for the environmentally sound management of hazardous wastes, promote co-operation between Parties and develop technical guidelines for the management of hazardous wastes. Jamaica is not a party to the Convention but has signed a bilateral agreement with France concerning the transboundary movement of hazardous waste.

### **Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Geneva 1995**

The amendment to the Convention obligates developed countries to prohibit immediately all transboundary movements of hazardous wastes destined for final disposal in other States. It also requires developed States to phase out and eventually prohibit transboundary movements of hazardous wastes destined for recovery or recycling. Jamaica has not accepted the amendment.

### **Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal, Basel 1999**

The Protocol seeks to provide a comprehensive regime for liability and an adequate and prompt compensation for damage resulting from the transboundary movement of hazardous wastes and other wastes. Jamaica is not a party to the Protocol.

### **International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990**

This Convention requires that all Parties take appropriate measures to prepare for and respond to an oil pollution incident and cooperate and provide advisory services, technical support and equipment. Jamaica is a party to the Convention.

### **Vienna Convention for the Protection of the Ozone Layer, Vienna 1985**

The Convention mandates that Parties take appropriate measures to protect human health and the environment against the adverse effects of human activities, which modify the ozone layer. Jamaica is a party to this Convention.

### **Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal 1987, as amended London 1990, Copenhagen 1992, Montreal 1997, Beijing 1999**

This Protocol aims to reduce and eventually eliminate the emissions of man-made ozone depleting substances. Jamaica is a party to the Protocol and has accepted the amendments of 1990 and 1992.

#### **United Nations Framework Convention on Climate Change, New York 1992**

The Convention aims to stabilize greenhouse gas concentrations in the atmosphere at a level that prevents dangerous human-induced interference with the climate system. It calls on Parties to take into account climate change in matters such as agriculture, natural resources and activities involving seacoasts. Parties must develop national programs to slow climate change and cooperate in reducing greenhouse gas emissions, especially from energy, transport, industry, agriculture, forestry and waste management. Jamaica is a party to the Convention.

#### **Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto 1997**

The Protocol seeks to reduce the emissions of greenhouse gases. It sets specific targets for emissions reductions by developed countries. It also identifies various sectors in which actions should be considered when developing national programs to combat climate change, including energy, transport, industry, agriculture, forestry and waste management. Jamaica is a party to the Protocol.

#### **Convention on the international trade in endangered species of wild fauna and flora, Washington 1973**

This Convention bans the international trade in an agreed list of endangered species of wild flora and fauna, including sea turtles and black coral. It also mandates that national authorities be established to monitor and regulate the trade in other species that might become endangered. Jamaica is a party to this Convention and has enacted legislation to implement the Convention.

#### **Convention on biological diversity, Rio de Janeiro 1992**

This Convention seeks to conserve biological diversity, ensure the sustainable use of biological diversity and ensure the equitable sharing of benefits derived from genetic resources. It addresses all aspects of biological diversity, genetic resources, species and ecosystems. Jamaica is a party to the Convention.

#### **Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Montreal 2000**

The Protocol seeks to protect biological diversity and the potential risks posed by living modified organisms resulting from modern biotechnology. Jamaica is not a party to the Protocol.

#### **Convention on Wetlands of International Importance Especially as a Waterfowl Habitat, RAMSAR 1971**

The Convention seeks to ensure the conservation or restoration and rehabilitation of wetlands. The Parties must include wetland conservation within their national land-use planning and establish nature reserves on wetlands. Jamaica is a party to the Convention and has designated the Black River Lower Morass in St. Elizabeth as a Ramsar site.

#### **Convention on the Conservation of Migratory Species of Wild Animals, 1979**

The Convention seeks to prevent migratory species from becoming endangered and requires parties to promote and support research on migratory species; provide protection for listed species; conserve and restore habitats where feasible and appropriate; and minimize adverse effects of activities and obstacles. Jamaica has signed this Convention but has not yet become a party to the Convention.

#### **International Convention for the Regulation of Whaling, 1946**

This Convention provides for the proper conservation of whale stocks and the orderly development of the whaling industry. It established the International Whaling Commission to monitor activities with regard to whale stocks. Jamaica was a party to this Convention but withdrew from it on 30 June 1984.

#### **United Nations Convention to Combat Desertification in those Countries experiencing Serious Drought and/or Desertification, Particularly in Africa, Paris 1994**

The Convention aims to promote effective action through innovative local programs and support of international partnerships. The Convention requires the implementation of national and regional action programs, which should emphasize popular participation, and the creation of an enabling environment designed to reverse land degradation. Jamaica became a party to the Convention by accession on 12 November 1997.

#### **International Tropical Timber Agreement, 1983**

This Convention seeks to facilitate the trade in tropical timber. It also deals with the conservation and management of tropical forests and is the only binding international agreement on this subject. Jamaica is not a party to the Convention.

#### **United Nations Convention on the Law of the Sea, Montego Bay 1982**

This Convention is the most comprehensive Convention governing all aspects of ocean space. It covers a wide array of subjects relating to ocean matters, including inter alia, delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes. Jamaica is a party to the Convention and has implemented some of the provisions of the Convention through the Maritime Areas Act and the Exclusive Economic Zone Act, which set out the rights and obligations in the territorial sea, the archipelagic waters and the exclusive economic zone. The Minister responsible for Foreign Affairs is responsible for implementing the Acts and any subsidiary legislation arising out of the Acts.

#### **Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, New York 1995.**

The Agreement seeks to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks. Parties are required to, inter alia, assess the impacts of fishing, other human activities and environmental factors on target stocks and species belonging to the same ecosystem; adopt, where necessary, conservation and management measures for species belonging to the same ecosystem; minimize pollution, waste, discards; protect biodiversity in the marine environment; prevent or eliminate overfishing and excess fishing capacity. Jamaica is not a party to the Agreement but it has signed it.

### **6.2.2 Regional Conventions**

#### **Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Cartagena 1983**

The Convention requires parties to adopt measures to prevent, reduce and control pollution from ships, pollution caused by dumping, pollution from sea-bed activities, airborne pollution and pollution from land-based sources and activities. It also mandates Parties to use appropriate measures to protect and preserve rare or fragile ecosystems, as well as the habitats of depleted, threatened or endangered species. Parties must also develop technical and other guidelines for the planning and environmental impact assessments of important development projects in order to prevent or reduce harmful impacts on the area of application. Jamaica became a party by ratification on 1 April 1987.

#### **Protocol concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region, Cartagena 1983**



The objective of the Protocol is to strengthen national and regional preparedness and response capacity. It serves to foster and facilitate cooperation and mutual assistance among nations and territories in cases of emergency in order to prevent and control major oil spill incidents. Jamaica became a party by ratification on 1 April 1987.

#### **Protocol concerning Specially Protected Areas and Wildlife, Kingston 1990 (SPAW)**

The objective of the Protocol is to protect rare and fragile ecosystems and habitats, thereby protecting the endangered and threatened species residing therein. It is the most comprehensive treaty of its kind and acts as a vehicle to assist with regional implementation of the broader Convention on Biological Diversity. Jamaica signed the Protocol on 18 January 1990 but has not yet ratified it.

#### **Protocol concerning pollution from Land-Based sources and Activities, Oranjestad, Aruba 1999**

The Protocol sets out a framework for cooperation. It establishes a list of land-based sources and activities and their associated contaminants of greatest concern to the marine environment of the Wider Caribbean. It also outlines and establishes the process for developing regional standards and practices for the prevention, reduction and control of those sources and activities identified. It establishes specific regional effluent limitations for domestic wastewater (sewage) and requires Parties to develop specific plans, programs and other measures for the prevention, reduction and control of agricultural non-point sources. Jamaica is not a party to the Protocol.

### **6.2.3 Bilateral Conventions**

#### **Agreement between the Government of the Republic of France and the Government of Jamaica for the Export of Polychlorinated Biphenyls, 15 December 1995**

This Agreement provides for the export of polychlorinated Biphenyls from Jamaica for disposal in France in accordance with the Basel Convention.

#### **Maritime Delimitation Treaty between Jamaica and the Republic of Colombia, 12 November 1993**

The treaty delimits the continental shelves and exclusive economic zones of Jamaica and Colombia. It also establishes within a certain sector of those maritime areas, a "Joint Regime Area" for the purpose of joint management, control, exploration and exploitation of the living and non-living resources therein, protection and preservation of the marine environment, conservation of living resources.

#### **Agreement between the Government of Jamaica and the Government of the Republic of Cuba on the Delimitation of the Maritime Boundary between the two States, 18 February 1994**

The treaty delimits the continental shelves and exclusive economic zones of Jamaica and Cuba. It also allows for co-operation in the development and implementation of programmes in navigational safety, search and rescue, hydrographic surveys, scientific research, and preservation and protection of the marine environment.

**Maritime Transportation Agreement between the Government of the Republic of Cuba and the Government of Jamaica, 23 September 1999.**

The Agreement promotes balanced development in maritime transportation, encourages and facilitates maritime transportation, allows for mutual recognition of tonnage certificates and other maritime transport documents, tax exemption, technical co-operation. It also establishes a Maritime Joint Commission to discuss effective co-operation, activities of shipping companies and vessels of the parties, the development of procedures for exchange of port data and other relevant information, as well as the development and implementation of mechanisms to ensure that customs and entry regulations are non-discriminatory.

**Protocol on Maritime Co-operation between the Government of Jamaica and the Government of Norway, 24 January 1980**

The Agreement encourages maritime co-operation between the parties' institutions, organisations, enterprises and nationals.

**6.2.4 Non-binding Environmental Instruments**

Agenda 21, 1992 (Chapter 17)

Agenda 21, 1992, Forest Principles, 1992

Global Program of Action for the Protection of the Marine Environment from Land-based Activities

Agenda 21 for the Travel and Tourism Industry 1995

Global Code of Ethics for Tourism 1999

Principles of Conduct in the Field of the Environment for the Guidance of States in the Conservation and Harmonious Utilization of Natural Resources shared by two or more States

Conclusions of the Study of Legal Aspects concerning the Environment Related to Offshore Mining and Drilling within the Limits of National Jurisdiction

Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources

Cairo Guidelines and Principles for the Environmentally Sound Management of Hazardous Wastes

Goals and Principles of Environmental Impact Assessment

London Guidelines for the Exchange of Information on Chemicals in International Trade

Code of Ethics on the International Trade in Chemicals

## **7.0 PROPOSED ROLE OF THE COUNCIL AND FINANCIAL ARRANGEMENTS**

The main role of the Council is to coordinate the activities that support the management of the ocean and coastal zone. In its coordinating role, the Council seeks to fulfill the following objectives:

1. Support government's initiative in promoting sustainable use and management of ocean and coastal resources.
2. Provide a high level forum for the discussion of important ocean and coastal issues, priorities, and best practices.
3. Foster partnerships between the public and private sector and non-profit organizations (NGOs) geared towards the management of coastal resources
4. Advance public understanding and support for the key issues of sustainable development of coastal resources.

In its present form, the Council functions as a high-level multi-disciplinary and inter-agency advisory body on matters related to ocean and coastal zone management. In essence, the Council brings together Ministries; NGOs and the private sector to discuss and advise on matters that are of national importance which affect the coastal zone of Jamaica. The Council however does not yet have power to implement policy and/or strategies for the management of the coastal zone that it may support. The final decision to implement and/or manage a particular issue that develops, or is discussed at the Council regarding the ocean and coastal zone, rests with the line ministry.

Furthermore, the Council at present does not have the technical expertise or the manpower that would be necessary for day-to-day operation in implementation of the Policy. An existing agency involved in matters of ocean and coastal zone is not likely to fulfill this mandate.

The following therefore is the existing lacuna, which will hamper the effective implementation of the Policy:

- The Council only has an advisory role and lacks a legal mechanism for a direct involvement in overseeing the implementation of the Policy.
- The Council lacks the financial mechanisms necessary to oversee the implementation of the Policy.
- There is little awareness within the various government agencies and also among the public on the role of the Council.
- There is little awareness at the Council on the ongoing as well as future programs and projects related to ocean and coastal zone management being undertaken by agencies not necessarily represented at the Council.
- Grass-root level organizations are not adequately represented on the two working groups of the Council.
- To have an effective implementation of the Policy, it therefore becomes apparent that the coordinating mechanisms need to be strengthened either through the Council or, by assigning a body to implement the Policy.

In light of above, it is important that the Council have a new role that will enable it to have a direct involvement in overseeing the implementation of the Policy on Ocean and Coastal Zone Management. Only then can the goal of integrated coastal zone management be achieved in the future. A more pragmatic approach in the present circumstances would be to strengthen the existing role of the Council. To that effect, the following is being proposed:

- The advisory and coordinating role of the Council should continue. However, the coordinating role needs to be established within a legal framework.
- Statutory authority must be granted to the Council to ensure accountability.
- Develop a mechanism for financial advocacy in order to administer funds. The Council should therefore:
  - Be empowered to formulate a budget for its activities on an annual basis;
  - Have its own operational budget as well as be in a position to disburse funds for the implementation of the Policy.
- Additionally, it is being proposed that the future role of the Council should include:
  - Collection and consolidating information on existing programs and projects relating to ocean and coastal zone management;
  - Monitoring of existing, as well as proposed programs and projects relating to ocean and coastal zone management;
  - Sensitizing the various agencies and the public at large on the role of the Council;
  - Developing links to local government to ensure broad-based participation in decision-making, especially from the grass-root level.
- Development of a management structure to oversee the implementation of the Policy.
- Establishing an ocean and coastal management trust fund.

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## A. GLOSSARY

### **Alternative Tourism**

Promotion of non-traditional tourist activities such as eco-tourism, nature tourism and heritage tourism.

### **Archipelagic State**

A state composed of a group of islands.

### **Beach**

A strip of sand, gravel or pebbles, covering the seashore between the highwater and low water marks.

### **Bleaching**

The loss of colour in corals because of expulsion of zooxanthellae when water temperatures are high.

### **Biodiversity**

The total number of genes, species and ecosystems in a region.

### **Coastal Lagoon**

A shallow lake of water between the coast and a barrier island, sand bar, shingle spit or coral reef.

### **Coastal Zone**

The coastal zone (or the coastal area) pertains to the entire area influenced by, and influencing coastal resources and eco-systems. In the case of estuaries and coastal watersheds this boundary might extend well inland of the narrow land-sea interface. Seaward, it extends to the farthest limits of Jamaica's Exclusive Economic Zone (EEZ), including the ocean floor.

### **Conservation**

The protection and sustainable use of the natural environment, including landscapes and wildlife.

### **Continental Shelf**

Part of the edge of a continent, which continues under the sea as a shallow sea floor, dropping off steeply at the edge of the shelf.

### **Coral Reefs**

Tropical, shallow water ecosystems that typically consist of carbonate rock and support the growth of coral species.

### **Co-management**

The shared management (including planning, execution and enforcement) of public facilities. Management parties include government agencies and non-government agencies.

### **De-coupling**

Improving living standards (economic growth) while at the same time reducing the environmental pressure.

### **Eco-development**

Development which takes environmental impact into account and holds sustainable management as its ultimate aim.

### **Ecosystem**

A community of living organisms, their habitats, and interactions with each other and the surrounding environment.

### **Ecotypes**

Ecological communities of plants and animals.

### **Endangered Species**

An animal or plant, which is so rare that it, is likely to suffer from extinction.

### **Exclusive Economic Zone (EEZ)**

The area of a country's coast which extends for 200 nautical miles out to sea, controlled by individual states, no longer common property.

### **Encroachment**

A physical structure established within a designated area.

### **Estuary**

The mouth of a river where fresh river water meets seawater and associated mud plains.

### **Eutrophication**

Nutrient enrichment to coastal waters which can result in the proliferation of algae.

### **Fishing Industry**

The catching, processing and marketing of fish, shellfish, seaweed and other products from the sea, or inland fisheries.

**Greenhouse Effect**

The gradual warming of the earth's atmosphere caused by the build-up of certain gases in the atmosphere and which may result in sea-level rise.

**Information Technology**

Combination of electronic computing techniques and electronic communication.

**Integrated Coastal Area Management (ICAM also known as ICZM or ICM)**

Defined as a process in which co-ordinated strategies are developed and implemented for the protection of coastal areas and resources, to achieve the conservation and sustainable use of these resources (UNEP, 1999).

**Intertidal Zone**

The area between the high water mark and the low water mark. Sometimes called the littoral zone.

**Island Shelf**

Part of the edge of an island, which continues under the sea as a shallow sea floor, dropping off steeply at the edge of the shelf.

**Law of the Sea**

An agreement between maritime countries about who controls various areas in the seas and oceans.

**Ocean**

A very large sea which usually separates continents. There are five oceans - Pacific, Atlantic, Indian, Arctic and Antarctic.

**Ocean Floor**

The solid bases of the ocean, which may be, covered by sand, mud or bare rock. Also called the seabed.

**Offshore Installations**

Equipment or apparatus placed and fixed in the sea or ocean.

**Maritime**

Of or near the sea, or affected by the sea.

**Mangroves**

Constituent plants of a tropical intertidal forest community or the community itself, found in coastal areas.

**Natural Resources Management**

The management of natural resources (any

substance found in nature that is of use to people) to ensure sustainable use.

**Non-renewable Resources**

Natural resources which cannot be replaced once they have been used, such as oil and coal.

**Pollution**

The addition of unwanted substances to the environment which creates an imbalance in ecosystems, poisoning air, water and soil.

**Parks and Protected Areas**

An area of land or water (or both) designated for management in order to protect and maintain its ecological systems, biodiversity and/or specific natural, cultural or aesthetic resources.

**Preservation**

A form of conservation which mandates total protection of an area.

**Radioactive Waste**

Waste that emits harmful radiation, including cooling water from coastal nuclear power stations which discharge into the sea.

**Renewable Resources**

Natural resources which replace themselves, such as fish in the sea and trees in a forest.

**Sea**

An expanse of salt water, smaller than an ocean, e.g. The Caribbean Sea.

**Sea-Level**

The average height of the surface of the sea, the height of dry land is measured at its height above sea level.

**Seabed**

See **Ocean Floor**.

**Seagrass**

A group of vascular plants adapted to the marine environment and occurring in tropic shallow coastal waters.

**Ship Channel**

Designated and maintained zone of a sea or ocean primarily for shipping traffic.

**Stakeholder**

Any person, party, agency or entity which contributes toward or benefits from a particular

area or activity.

**Sustainable Development**

Meeting present needs without compromising the ability of future generations to meet their own needs.

**Underemployment**

Unproductive employment for little reward.

**Watershed**

The area of land that delivers run-off water, sediment and dissolved substances to a river.

## B. GOVERNMENT AGENCIES

Agency	Coastal-Related Mandate, Function and/or Activity
Airports Authority of Jamaica (AAJ)	Management of Norman Manley and Donald Sangster International Airports
Attorney General's Department (AGD)	Preparation of legal instruments
Civil Aviation Authority (CAA)	Regulation and control of airports, development guidelines in the vicinity of airports
Chief Parliamentary Council (CPC)	Review of documentation
Council on Ocean and Coastal Zone Management (COCZM)	Define national policy, promote co-ordination of administrative and operational functions, ensure compliance with enacted treaties and protocols
Environmental Control Division (ECD)	Water quality monitoring and testing
Fisheries Division (FD)	Fisheries management
Forestry Department (FD)	Watershed management
Jamaica Constabulary Force (JCF)	Enforcement of law and order
Jamaica Fire Brigade (JFB)	Control of fires (including forest fires)
Jamaica National Heritage Trust (JNHT)	Buildings, landmarks and artifacts of historical or archaeological importance
Jamaica Tourist Board (JTB)	Recreational areas/cruise ship terminals
Marine and Aviation Affairs Department (MAAD) in the Ministry of Foreign Affairs	Co-ordination of the development of marine and aviation policy
Maritime Authority of Jamaica (MAJ)	Marine transportation regulatory agency
Mines and Geology Division (MGD)	Regulation of mining and quarrying
Ministry of Land and the Environment (MLE)	Policy related to environmental matters and land use
Ministry of National Security and Justice (MNSJ)	Policy on matters of national justice
National Water Commission (NWC)	Treatment of water for domestic supply, treatment of wastewater and sewage
Office of Disaster Preparedness and Emergency Management (ODPEM)	Natural hazards contingency planning, disaster response and recovery
Office of the Harbour Master (OHM)	Regulation and safety of shipping in harbours and ports
Petroleum Corporation of Jamaica (PCJ)	Petroleum shipments
Planning Institute of Jamaica (PIOJ)	Initiation and co-ordination of planning for economic, financial, social, cultural and physical development
Port Authority of Jamaica (PAJ)	Management of ports and port operations
Scientific Research Council (SRC)	Pure and applied research



Agency	Coastal-Related Mandate, Function and/or Activity
Shipping Association of Jamaica (SAJ)	Provision of skilled labour to shipping industry operations and management of relevant parts of the industry
Tourism Product Development Company Ltd. (TPDCo.)	Standards and regulation of tourism product
Urban Development Corporation (UDC)	Development and planning
Water Resources Authority (WRA)	Ground water quality and extraction
Ministry of Tourism and Sports	Tourism policy and planning

### C. RELEVANT ORGANISATIONS IN CIVIL SOCIETY

Organisation	Mandate
Bluefields Peoples' Community Association (BPCA)	Community based activities and initiatives, including environmental projects
Caribbean Coastal Area Management (C-CAM)	Management of the Portland Bight Protected Area
Environmental Foundation of Jamaica (EFJ)	Management of debt-relief fund for protecting the environment
Friends of the Sea (FOTS)	Education, awareness and conservation of ocean resources
Jamaica Conservation and Development Trust (JCDDT)	National Parks Trust Fund, Blue and John Crow Mountains National Park
Jamaica Environment Trust (JET)	Environmental awareness particularly in schools
Jamaica Institute of Environmental Professionals (JIEP)	Accreditation of environmental professionals and monitoring of performance standards
Jamaica National Parks Trust Fund (JNPTF)	Raising and managing long-term funding support for the system of national parks
Montego Bay Marine Park Trust (MBMPT)	Management of the Montego Bay Marine Park
National Environmental Societies Trust (NEST)	Umbrella organisation for environmental NGO's
Negril Area Environmental Protection Trust (NEPT)	Management of the Negril area
Negril Coral Reef Preservation Society (NCRPS)	Management of the Negril Marine Park
Portland Environment Protection Agency (PEPA)	Raising awareness of environmental issues
St. Ann Environmental Protection Agency (STAEPA)	Education and raising awareness of environmental issues
St. Thomas Environmental Protection Association (STEPA)	Protection of the St. Thomas environment

#### D. ACADEMIC INSTITUTIONS

Academic Institution	Mandate
College of Agricultural Science and Education (CASE)	Training in agricultural sciences, agri-business and related subjects
Discovery Bay Marine Lab and Port Royal Marine Lab. (DBML/PRML)	Education and training; coastal and marine resource research; laboratory testing; ecosystem monitoring
Hofstra University Marine Laboratory (HUML)	Off-shore laboratory facilities providing education on tropical marine systems for students from Hofstra University on the USA mainland
Jamaica Maritime Institute (JMI)	Maritime training and education
University of Technology (UTech)	Education and training in related subjects, post-graduate research
University of the West Indies (Centre for Marine Sciences) (UWI/CMS)	Education and training in coastal and marine resources, post-graduate research

## **E. PARISH LEVEL COASTAL AND MARINE CHARACTERISTICS, CONSTRAINTS AND OPPORTUNITIES**

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### **KINGSTON AND SAINT ANDREW**

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#### **Overview**

The coastal area of Kingston/St. Andrew stretches from the Fresh River to the west to Bull Bay (Nine Miles) to the east, and includes the Kingston Waterfront and the Palisadoes Peninsula on which the Norman Manley International Airport and Port Royal are located. Existing development in the area includes a variety of commercial and industrial activities. Many of these activities, including the Jamaica Public Service Company (JPSCo.) main power plant, Petrojam Refinery, container port, airport, government offices and the Bank of Jamaica are critical facilities vital to the nation's well-being. In addition, other developmental activities alongside or close to the water's edge include a variety of housing schemes with high concentrations of residential units.

Kingston is the major metropolitan area of Jamaica, and the nation's centre of industry and commerce. There are 21 hotels in Kingston and St. Andrew, with 1,677 rooms and 3,297 beds. In 1999, the population of Kingston and Saint Andrew was estimated to be 711,200. Kingston Harbour is the most heavily used port, offering several facilities for docking and berthing, in addition to the container terminal for trans-shipment operations. There are two main port facilities: Kingston Wharves, which are privately owned, and deal mostly with domestic cargo and break bulk cargo (import and export); and Kingston Terminal Operators (KTO), which deal mostly with transshipment cargo (80 percent) and domestic cargo (20 percent). In 1999, Kingston handled 2,087 cargo vessels and 74 non-cargo vessels (for example: bunker and/or research vessels).

Industries with shorefront access include food processing, cement and flour production, and oil refining among others. 16 factories and 4 small industrial complexes were built in the coastal area, and the Port Authority has provided factory space in the Kingston free-trade zone for manufacturers. Kingston Harbour and Hunts Bay act as receiving water bodies for both industrial and domestic wastes.

There are five fishing beaches and four public bathing beaches in Kingston and Saint Andrew. Due to pollution effects from industry and sewage, however, recreational bathing is limited in the Kingston Harbour area. Other formal recreational activities include boating and yachting.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> There are seagrass beds and turtle feeding sites off Port Royal. In the 1980s, manatees were observed in the seagrass beds of Kingston Harbour.</p> <p>Mangroves are also important as they serve as a nursery area for young fish, and other species, and as a shelter for dolphins</p> <p><b>Rare and endangered species:</b> Brown Pelicans, Crocodiles and Hawksbill turtles, mangroves and coral cays and reefs in the Palisadoes/Port Royal area.</p>	<p><b>Existing:</b> Palisadoes and Port Royal Protected Area was declared.</p> <p><b>Proposed:</b> Port Royal Cays.</p>	<p><b>Tourism and Recreation:</b> Museum and historical sites at Port Royal; Copacobana, Palm Beach and Gunboat Beach; Rockfort Mineral Springs, Lime Cay. Boating and yachting through the Royal Jamaica Yacht Club and Morgans Harbour Hotel.</p> <p><b>Industry and industrial port:</b> Industrial uses stretch from Newport West to Harbour View.</p> <p><b>Illegal dumpsites:</b> Dumping and littering on Port Royal Spit.</p> <p><b>Fishing:</b> Despite pollution, fishing is conducted in Kingston Harbour; also in the Port Royal Cays. There is a fishing village at Rae Town and at Greenwich Farm.</p> <p><b>Natural coastline:</b> At delta of the Hope River and at Bull Bay, and sections of the Palisadoes strip.</p>	<p><b>Degraded water quality:</b> Coastal water quality is very poor.</p> <p><b>Coastal erosion:</b> There are serious coastal erosion problems, for example, at Bull Bay.</p> <p><b>Damaged and threatened reef systems:</b> Reefs are impacted by pollution from both solid and sewage waste sources.</p> <p><b>Impacted mangrove wetlands:</b> Mangroves degraded at Port Royal and Hope Bay.</p> <p><b>Sedimentation:</b> Many silt-carrying rivers and gullies feed into Kingston Harbour. (e.g. Sandy Gully and Rio Cobre).</p> <p><b>Sewage pollution (from point and non-point sources):</b> Sewage treatment plants generally do not function effectively. The Kingston Harbour continues to receive high fecal loads.</p> <p><b>Other:</b> Over fishing; exploitation of seabird eggs and turtles on the Port Royal Cays: development along</p>	<p><b>Local NGO activity/ active public involvement:</b> The Port Royal Environmental Management Trust (PREMT) is involved, especially as it relates to the proposed new development of Port Royal as a prime tourism destination. Jamaica Environment Trust (JET) organizes beach clean-ups along Palisadoes for Coastal Clean-Up Day.</p> <p><b>Recreation potential:</b> Port Royal Cays, particularly Lime Cay for swimming and snorkeling. The Cays are important for scientific work. The Department of Life Sciences at UWI has a marine Laboratory based at Port Royal. The Port Royal Development, with its associated Cruise Ship Terminal, also offers considerable recreation potential.</p> <p><b>Mariculture potential:</b> Oysters and Shrimp farming.</p> <p><b>Ecotourism:</b> Tours are currently conducted at Fort Charles in Port Royal. Greater potential exists for heritage tourism, especially</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>waterfront susceptible to storm surge and flooding. Other multiple hazards include earthquakes and liquefaction. Landslide potential in the Port Royal mountains. Removal of ornamental vegetation along Palisadoes is a continuing problem.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Ground water is contaminated in alluvial aquifers. Some salt water intrusion occurs into the Long Mountain and other limestone aquifers.</p> <p><b>Sand extraction from beaches and dunes:</b> Illegal sand extraction takes place occasionally, particularly in the eastern section. Sand removal and erosion at Copacabana.</p>	<p>for other sections of Port Royal..</p>

## SAINT THOMAS

### Overview

The coastal area of St. Thomas is located between the Bull Bay and Hector's River. Large wetland areas, including the Cow Bay swamps and Great Morass, along with significant areas of deciduous forest are found along the coast. Agriculture is the principal land activity, and crops cultivated include coconuts, sugar cane and bananas. Smaller areas are used for intensive mixed farming and cattle grazing. At Bowden, both private farmers and the Ministry of Agriculture grow oysters. There are five public bathing beaches and fourteen fishing beaches. Housing is found in several areas. Three factories were built in the coastal area; at Morant Bay, Seaforth and Yallahs. The industries here are involved in manufacturing and food processing. St. Thomas has three hotels. In 1999, the population of Saint Thomas was estimated to be 91,900.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> St. Thomas Great Morass, the third largest in Jamaica: coastal forest; wetlands; coral reefs.</p> <p><b>Rare and endangered species:</b> Mangrove wetlands and seagrass beds are under stress. Manatees have been reported around Cow Bay. Sea turtles have also been observed. Crocodiles are found in Cow Bay and the Great Morass.</p> <p>The endangered Giant Swallowtail Butterfly, and the Blue Kite Tail Butterfly are found in the mountainous parts of the parish.</p>	<p><b>Existing:</b> None.</p> <p><b>Proposed:</b> Morant Point proposed as potential national park. Also Roselle Falls and Yallahs Pond (very saline).</p>	<p><b>Tourism and recreation:</b> Although there are several public bathing beaches, recreation and tourism are not significant activities, with only three hotels in the parish.</p> <p><b>Industry and industrial port:</b> Factories in Yallahs.</p> <p><b>Illegal dumpsites:</b> Port Morant used to be a site, but despite being closed, people still dump garbage there.</p> <p>Garbage tends to be deposited along the roadside, for example, on the main road leading to Bowden, and on the road to Albion.</p> <p><b>Fishing:</b> Several fishing</p>	<p><b>Degraded water quality:</b> minimal.</p> <p><b>Coastal erosion:</b> Erosion is a problem at Roselle, Prospect and Copacabana. Erosion east of Morant River.</p> <p><b>Damaged and threatened reef systems:</b> Status not known.</p> <p><b>Impacted mangrove wetlands:</b> Considerable cutting for charcoal burning.</p> <p><b>Sedimentation (from upland development):</b> Sediment is transported by the Negro River, Morant River and Yallahs River.</p>	<p><b>Local NGO activity/active public involvement:</b> Saint Thomas Environmental Protection Association (STEPA).</p> <p><b>Recreation potential:</b> Potential exists to the east of Morant Bay in the area of Lyssons and Prospect.</p> <p><b>Mariculture potential:</b> Potential for oyster culture.</p> <p><b>Ecotourism:</b> The potential exists for ecotourism in the Blue and John Crow Mountains National Park, provided that the necessary improvements (such as the fixing of the roads and proper</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>beaches, including Cow Bay, Rocky Point, Roselle and Grants Pen.</p> <p><b>Natural coastline:</b> Much of the coastline is in a natural state, however there are sugar and banana farms at Tropicana and Eastern Banana Company respectively. There is large scale sand mining in Yallahs River.</p>	<p><b>Sewage pollution (from point and non-point sources):</b> Dunder from Tropicana sugar factory causes a pollution problem at Rocky Point</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> No large scale instances reported.</p> <p><b>Sand extraction from beaches and dunes:</b> Sand removal from Copacabana.</p> <p><b>Squatter occupancy:</b> This is a major problem at Poor Man's Corner and White Horses.</p> <p><b>Other:</b> Susceptibility to hurricane. Flood potential around Yallahs River, in the Great Morass, and along the coast between Four Mile Wood and the Salt Pond.</p>	<p>signage) are put in place.</p>

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**PORTLAND**

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## Overview

The coastal area of Portland extends from Hector's River to Palmetto Point. Two prominent wetland areas are the Turtle Crawle and Windsor Castle swamps. Coastal vegetation also includes deciduous forest and shrub species. Agriculture is a major land activity; the main crops are bananas and coconuts, with smaller areas cultivated with sugar cane or used for intensive mixed farming. Coffee is also cultivated. Cattle grazing also take place.

Residential development covers significant tracts of land, with urban residential development found in the capital town of Port Antonio. There are fifteen hotels in Port Antonio, with 397 rooms and 785 beds. Port Antonio is expected to grow as a tourist centre in the future. Fifteen public bathing beaches and seventeen fishing beaches are in use. In 1999, the population of Portland was estimated to be 79,300.

Surface mining takes place between West Harbour and Saint Margaret's Bay, and illegal sand mining is sometimes reported at beaches at St. Margaret's Bay to supply the construction industry. In Port Antonio, there are two main ports that actively serve cruise ships and banana exporting vessels. The Bound Brook Wharf deals with banana exports, while the Kenwright Pier deals with cruise shipping, although the volumes for cruise ships are very low, with only about one or two cruise ships per year. In 1999, 56 "non-cruise" ships came into Port Antonio (i.e. ships that come to port for other reasons, such as for bunker and/or research purposes). The Ministry of Agriculture uses the eastern section of the East Harbour, Port Antonio, for the cultivation of oysters.

Factory space has been leased to short term users, but there are no other significant industrial uses.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Blue Lagoon: seagrass beds in Crawle Harbour; sea turtle nesting sites at Hope Bay and Fairy Hill beaches, Innis Bay, Manchioneal, Frenchman's Cove, Long Bay and Orange Bay.</p> <p><b>Rare and endangered species:</b> Sea turtles;</p> <p>manatees reportedly seen; West Indian Whistling Duck, Yellow Snake; the Giant Swallowtail</p>	<p><b>Existing:</b> The Blue Lagoon, currently protected through a Tree Preservation Order. Blue and John Crow Mountains National Park.</p> <p><b>Proposed:</b> San San has been proposed as a marine park. Proposed Marine Park from Shiprock (east of Rio Grande) to Northwest Point.</p> <p>Conservation corridor between Blue and John Crow Mountain and San San.</p>	<p><b>Tourism and recreation:</b> Major opportunity at San San; presently there are 15 hotel accommodations in Port Antonio, with 397 rooms and 785 beds. Diving and snorkeling are popular.</p> <p><b>Industry and industrial port:</b> None</p> <p><b>Illegal dumpsites:</b> Not a major problem, as few sites where garbage is dumped. One site is in Saint</p>	<p><b>Degraded water quality:</b> Blue Lagoon is reported to have high bacterial levels from pit toilets.</p> <p>Survey shows degraded reefs and poor stocks of reef fish, indicating overfishing.</p> <p><b>Coastal erosion:</b> This is a general problem, with areas of note being Orange Bay, St. Margaret's Bay and Buff Bay.</p> <p><b>Damaged and threatened</b></p>	<p><b>Local NGO activity/public involvement:</b> Yes, Portland Environmental Protection Association (PEPA). They are interested in establishing a conservation corridor from the Blue and John Crow Mountains to San San in Port Antonio.</p> <p><b>Recreation potential:</b></p> <p>Considerable opportunities for upgrading beach facilities.</p> <p><b>Mariculture potential:</b></p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p>butterfly, and the coney are also found in the Blue and John Crow Mountains National Park.</p>		<p>Margaret's Bay.</p> <p><b>Fishing:</b> A number of fishing beaches are in the parish, including Hector's River, St. Margaret's Bay, Buff Bay and Orange Bay.</p> <p><b>Natural coastline:</b> Much infrastructure exists along the coast.</p>	<p><b>reef systems:</b> Not in best condition, but lack specific information.</p> <p><b>Impacted mangrove wetlands:</b> To some extent, for example in Turtle Crawl.</p> <p><b>Sedimentation (from uplands development):</b> Coffee cultivation and small-site hillside farming contribute to high levels of sedimentation. There has been massive uplands coffee development and resultant land clearing. This is the wettest parish in Jamaica. Sediments, pesticide residue, and fertilizer use represent threats to coastal waters. Flooding and land slippage occurs during periods of prolonged rainfall.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Pit toilets responsible for high bacterial level at San San. San San bay has also been reported to have high bacterial levels from coastal housing development.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Limestone aquifer shows saline intrusion (Fairy Hill</p>	<p>Oyster cultivation discontinued because of poor water quality.</p> <p><b>Ecotourism:</b> An existing activity is Valley Hikes, and Sommerset Falls. High potential exists for further developing ecotourism; assets include waterfalls (Reach Falls), pristine areas, rafting on the Rio Grande; generally good coastal water quality; train service previously existed between Kingston and Port Antonio and there is some talk about reinstating this service.</p> <p>Marina and Cruise Shipping: 3 Marinas exist in Port Antonio with major harbor development being planned, these present considerable opportunities.</p> <p>Not much done anymore but licensed quarrying carried out above bridge. The island in the middle of the resulting accumulation of sand is a</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>area).</p> <p><b>Sand extraction from beaches and dunes:</b> Occasional Sand quarrying in St. Margaret's Bay and Hope Bay, and at mouth of Rio Grande river.</p> <p><b>Squatter occupancy:</b> A major problem. Of two main types: commercial and recreational. Relocation exercise planned for squatters on the Foreshore Road in Port Antonio (on the infirmary land). Bryan's Bay also a squatter site.</p> <p><b>Other:</b> Destructive storm potential at Dover. Public access to beaches is a problem.</p>	<p>threat to the St. Margaret's Bay Bridge if not quarried.</p>

## SAINT MARY

### Overview

The coastal area of St. Mary is located between Palmetto Bay and the White River. Coastal vegetation is primarily deciduous forest. Land-use is dominated by agriculture, with sugar cane the major crop, followed by bananas and coconuts. Smaller areas are utilized for orchards and intensive mixed crops. Cattle are raised on both improved and unimproved pastureland. Urban and rural residential development is also found along the coast. Tourism activities are relatively few, with only fourteen hotels located in the parish. There are seven public bathing beaches and nine fishing beaches. Industrial use is limited. A small industrial complex was developed at Annotto Bay. Gray's Inn Sugar Factory is now the site for the Eastern Banana Estates. In 1999, the population of Saint Mary was estimated to be 113,000.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> None of significance.</p> <p><b>Rare and endangered species:</b> Sea turtles have been reported along some of the beaches.</p>	<p><b>Existing:</b> None.</p> <p><b>Proposed:</b> An Oracabessa marine park has been proposed, but it is not regarded as high on the priority list.</p>	<p><b>Tourism and recreation:</b> Only in the western section where there are two large hotels, the Boscobel Hotel and the Couples Hotel (both part of Super Clubs chain).</p> <p><b>Industry and industrial port:</b> None.</p> <p><b>Illegal dumpsites:</b> None.</p> <p><b>Fishing:</b> Some nine fishing beaches exist in the parish, including Oracabessa, Annotto Bay and Dover.</p> <p><b>Natural coastline:</b> The western section is developed from a tourism standpoint; the eastern section is primarily agricultural.</p>	<p><b>Degraded water quality:</b> Generally good coastal water quality.</p> <p><b>Coastal erosion:</b> No problems except at Galina (impacted by hurricane). Some erosion at Annotto Bay, undermining of coastal road structure near Port Maria.</p> <p><b>Damaged and threatened reef systems:</b> Reef system generally in poor condition.</p> <p><b>Impacted mangrove wetlands:</b> Little mangrove area.</p> <p><b>Sedimentation (from uplands development):</b> Some sediment from river flow.</p>	<p><b>Local NGO activity/active public involvement:</b> International School of Jamaica, Oracabessa Foundation.</p> <p><b>Recreation potential:</b> There is some potential for increased tourism.</p> <p><b>Mariculture potential:</b> None.</p> <p><b>Ecotourism:</b> Good potential for ecotourism in the eastern section; beachfront uninhabited; mountains along coast good for exploring; plantations such as Strawberry Fields offer opportunity for guided tours.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p><b>Sewage pollution (from point and non-point sources):</b> Sewage enters Port Maria Bay and Port Antonio Bay.</p> <p><b>Ground water contamination (pollution and salt-water intrusion):</b> No large-scale occurrence.</p> <p><b>Sand extraction from beaches and dunes:</b> There is a legal sand quarrying at the outer reaches of the Wag Water River and the Pagee River.</p> <p><b>Squatter occupancy:</b> None.</p> <p><b>Other:</b> Flat topography increases the vulnerability of Port Maria (capital) to hurricane damage. Landslide potential west of Port Maria and east of Pagee River. Flood potential west of Pagee River.</p>	

## SAINT ANN

### Overview

The White and Rio Bueno Rivers border the coastal region of Saint Ann. The Pear Tree River Swamp is a prominent wetland area, and the coastal vegetation also includes large deciduous forest stands and some shrub covered areas. Land along the coast is used mainly for agriculture, tourism and rural and urban housing. Cultivated crops are sugar cane, bananas and coconuts. Cattle rearing is conducted on both improved and unimproved pasture. There are hotels and guesthouses along the coast of St. Ann, and Ocho Rios is one of the island's major tourism centers. Residential areas occupy a significant portion of the coast, especially in the towns of Runaway Bay, Discovery Bay, Ocho Rios and Saint Ann's Bay, the capital. In 1999, the population of Saint Ann was estimated to be 163,700. There are 41 hotel accommodations in Ocho Rios, with 4,473 rooms and 10,077 beds. Saint Ann has nine fishing beaches and nine public bathing beaches. There is a small industrial complex at Seville.

There are two ports in St. Ann: Port Rhodes at Discovery Bay and Reynolds Pier in Ocho Rios and Ocho Rios Cruise Ship Pier. Kaiser Bauxite Company operates the former for the shipping of bauxite. The Government owns the latter, and occasionally cruise ships are diverted to the Reynolds Pier when the Ocho Rios cruise ship pier is full. In 1999, Ocho Rios handled 269 cruise ships and 24 "non-cruise ships (i.e. those ships which entered port for other reasons, such as for bunker and/or research purposes). In the same year, Port Rhodes handled 88 cargo ships. A few cargo ships loaded sugar for export. Bauxite is now exported from Reynolds.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Some beaches still have a few nesting sites for sea turtles. Concerns have been expressed about the effect of the emissions from vehicular traffic on the ferns in Fern Gully.</p> <p><b>Rare and endangered species:</b> Sea turtles have been reported on some beaches, and the Jamaica Boa in coastal woodlands.</p>	<p><b>Existing:</b> Ocho Rios Marine Park was declared a protected area last year under the NRCA Act, but no management plan has been developed.</p> <p><b>Proposed:</b> Discovery Bay, Pear Tree Bay and Runaway Bay are among those suggested for inclusion in the list of Protected Areas.</p>	<p><b>Tourism and recreation:</b> Active tourism development extends from Ocho Rios to Discovery Bay; there are at least 41 hotels in the parish, with 4,473 rooms and 10,077 beds.</p> <p><b>Industry and industrial port:</b> Bauxite and limestone mining. Bauxite shipping at Port Rhodes and Ocho Rios; small factory complex at Seville.</p>	<p><b>Degraded water quality:</b> High nutrient levels in Runaway Bay; serious water pollution in Ocho Rios Bay.</p> <p><b>Coastal Erosion:</b> Coastal erosion is a problem stemming from human activity affecting shoreline stability. Reef destruction also contributes to the erosion problem. There is a need to construct protective structures.</p>	<p><b>Local NGO activity/ active public involvement:</b> St. Ann Environmental Protection Association (STAEPA), and Friends of the Sea (FOTS).</p> <p><b>Recreation potential:</b> High tourism/recreation potential in the stretch between St. Ann's Bay, Seville, Dunn's River Falls and Salem (Laughlands).</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p><b>Illegal dumpsites:</b> Sites include one in Dunnsville, along the Parish Council road; one in Salem; and another along the Moneague main road.</p> <p><b>Fishing:</b> There are numerous fishing villages and nine fishing beaches. Examples include Discovery Bay, St. Ann's Bay (Brown's Wharf) and Mammee Bay.</p> <p><b>Natural coastline:</b> Coastline has much infrastructures, with further infrastructure development proposed.</p>	<p><b>Damaged and threatened reef systems:</b> Many dead reefs have been identified.</p> <p><b>Impacted mangrove wetlands:</b> There are only small mangrove stands along the coast.</p> <p><b>Sedimentation (from upland development):</b> Storm drains are a major contributor.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Sewage treatment plants have been installed to combat the sewage problem. EEC funding provided a sewage system for Ocho Rios; however there is still the issue of connection.</p> <p><b>Ground water contamination (pollution and salt-water intrusion):</b> Coast protected from saline intrusion by aquiclude to the north. Some local cases of increased nitrates in wells.</p> <p><b>Sand extraction from beaches and dunes:</b> This is a problem in the eastern end of the parish towards Saint Mary. Sand removal occurs occasionally from Braco bathing beach and Priory fishing beach.</p>	<p><b>Mariculture potential:</b> None.</p> <p><b>Ecotourism:</b> Potential exists, for example: Fern Gully.</p> <p><b>Other:</b> Ocho Rios Advisory Monitoring Committee, Ocho Rios Environmental Advisory Group, Community-based Water Quality Monitoring, Discovery Bay Marine Lab: Fisheries Improvement Program and Water Quality Lab.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p><b>Squatter occupancy:</b> This is a problem along the banks of the White River, and along coastal roads. Additional squatting areas are to be identified.</p> <p><b>Other:</b> Flood potential at St. Ann's Bay, and westwards along the coast. Some flood potential in Ocho Rios. Landslide potential at St. Ann's Bay and east of Greenwich Park. Other concerns include the carrying capacity of Dunns River, and the Dunns River water supply drying up; overfishing and other bad fishing practices.</p>	



## TRELAWNY

### Overview

The coastal area of Trelawny stretches from the Rio Bueno River to the end of Long Bay. Along the shoreline, The Hague Swamps provide a habitat for a diverse bird population. In addition to wetland species, the coastal vegetation includes deciduous forest species. Urban and residential housing is a main land use, especially in areas such as Falmouth, the capital, and the town of Duncans. There is some tourism, cattle ranching and agricultural use, the latter being confined to relatively small areas of sugar cane. Seven public bathing beaches and ten fishing beaches are in the parish. Trelawny has five hotel accommodations. In 1999, the population of Trelawny was estimated to be 72,600.

Grain is imported using the Rio Bueno port. In 1999, nine ships came to Rio Bueno. The only coastal factory is located in Falmouth, and is used for garment manufacturing.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Winns Morass, Lyons, Stoglans, Oyster, Half Moon, Salt Marsh Bays, Martha Brae River Estuary.</p> <p><b>Rare and endangered species:</b> The Cockpit Country is home to a number of endemic species, including the Black-billed and Yellow-billed parrots, the coney, the Giant Swallowtail Butterfly, the Jamaican Boa, and various species of orchids.</p> <p>Manatees and sea turtles are found along the coastline.</p>	<p><b>Existing:</b> Coral Spring – Mountain Spring Protected Area declared.</p> <p><b>Proposed:</b> Bush Cay, owned by PCJ and projected for tourism development, has potential for protected area designation; also Salt Marsh Bay and Hague Swamp (freshwater). A Game Reserve is in the area of Glistening Waters. Proposed action is for TEPA to acquire land (600 Ha.) for protection purposes.</p>	<p><b>Tourism and recreation:</b> Tourism focuses on Silver Sands Hotel; public beach deteriorated. Other attractions include Trelawny Beach Hotel, FDR, Glistening Waters in Oyster Bay, Swamp Safari (a crocodile attraction), and rafting on the Martha Brae River.</p> <p><b>Industry and industrial port:</b> Minor.</p> <p><b>Illegal dumpsites:</b> Not a major problem. Garbage was being dumped near to the Hague show grounds, which was cleared, but dumping has since resumed.</p> <p><b>Fishing:</b> Fishing is not a</p>	<p><b>Degraded water quality:</b> Poor coastal water quality: Glistening Waters marina has degraded the water quality in Glistening Waters (bioluminescent) Bay.</p> <p><b>Coastal erosion:</b> Not much.</p> <p><b>Damaged and threatened reef systems:</b> TEPA is concerned; program initiated to establish artificial reefs; some reef damage from sedimentation.</p> <p><b>Impacted mangrove wetlands:</b> Cutting for charcoal is a major problem, especially at Falmouth.</p> <p>Seedlings used as yam</p>	<p><b>Local NGO activity/active public involvement:</b> Trelawny Environmental Protection Association (TEPA), and Southern Trelawny Environment Protection Agency.</p> <p><b>Recreation potential:</b> Potential for heritage tourism; Falmouth proposed as a National Heritage Site.</p> <p><b>Mariculture potential:</b> Some potential in Oyster Bay but no current activity.</p> <p><b>Ecotourism:</b> There is already some activity in the form of tours to the Windsor Caves. Other activities</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>major activity; however, many spear fishermen in parish. Examples include Silver Sands and Braco. Both commercial and recreational fishing along coastline between Salt Marsh and Oyster Bays.</p> <p><b>Natural coastline:</b> Long stretches, for example, between Braco and Duncans.</p>	<p>sticks.</p> <p>Destruction also due to illegal residential development.</p> <p><b>Sedimentation (from uplands development):</b> Sediment from the Martha Brae River.</p> <p><b>Sewage pollution from point and non-point sources):</b> No sewage treatment; domestic waste flows directly to the sea.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Saline water occurs in the Duncan's area; may be due to faulting in aquiclude. Reports of organic loads at isolated points.</p> <p><b>Sand extraction from beaches and dunes:</b> occasional Sand extraction at Silver Sands Beach, Rose Hall and Half Moon bathing beaches and Florida beach.</p> <p><b>Squatter occupancy:</b> Not a major problem. Squatting occurs mainly on private, not government-owned land. Some problem sites include:</p> <p>near to Trelawny beach heading up to Duncans, at</p>	<p>include a wetland park, bird watching, and canoe and rafting trips. Greater potential exists in Cockpit Country, but it would need to be properly developed, to prevent large-scale destruction.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>Salt Marsh, and in Falmouth (Vanzielands area).</p> <p><b>Other:</b> Flood potential southwest of Falmouth. Morass/embayments threatened by agricultural ventures, garbage dumping, residential development and improper sewage disposal. River is suffering from soil erosion along its banks.</p>	

## SAINT JAMES

### Overview

The coastal area of St. James is located between Long Bay and the Great River. The shoreline is vegetated with deciduous forest and also includes smaller brush-covered areas. Montego Bay, the capital, is a major tourism and recreational centre. There are 52 hotel accommodations in Montego Bay, with 5,125 rooms and 10,605 beds. There are also several natural and man-made beaches.

Urban and rural housing are dominant land uses. Housing developed by the Urban Development Corporation (UDC) includes the approximately 5,000 units at Catherine Hall Estate developed in the 1970's. In 1999, the population of Saint James was estimated to be 178,000. Sugar cane is the main crop, although banana (mixed with forest) is also cultivated. Cattle rearing takes place on a relatively large scale. Wetlands reclamation has occurred in several areas to provide new land for tourism, housing and industrial development. There are ten public bathing beaches and seven fishing beaches in Saint James.

Significant commercial and industrial activities occur in Montego Bay, which is the second largest city of Jamaica. The Montego Bay Freeport has five factories and one small industrial complex for garment manufacturing, woodwork and food processing. The port of Montego Bay is very active, receiving both cargo and cruise ship business. In 1999, Montego Bay handled 199 cargo ships, 224 cruise ships and 13 "non-cruise" ships (i.e. ships which came to port for other purposes, such as for bunker and/or research). The Sangster's International Airport is located on the coastline.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Fish sanctuary; Bogue Lagoon.</p> <p><b>Rare and endangered species:</b> Sea turtles still nest on a few beaches in the parish.</p>	<p><b>Existing:</b> Montego Bay Marine Park.</p> <p><b>Proposed:</b> None</p>	<p><b>Tourism and recreation:</b> This is an area of intense tourism and recreational activity; of the 49 hotels, 16 are directly on the beach.</p> <p>The hotels account for 4,586 rooms with the 44 guesthouses accounting for additional 642 rooms.</p> <p><b>Industry and industrial port:</b> Montego Bay Freeport.</p>	<p><b>Degraded water quality:</b> Poor circulation and flushing action in Montego Bay.</p> <p><b>Coastal erosion:</b> Areas include the Montego Bay Freeport, and along the Rose Hall coastline.</p> <p><b>Damaged and threatened reef systems:</b> Half the reefs in shallow water are dead; reef degradation is attributed to over-harvesting of reef</p>	<p><b>Local NGO activity/active public involvement:</b> The Saint James Environmental Protection Trust (STEPT) is working with DEMO/NRCA on preparation of an environmental management plan.</p> <p>A local advisory committee for the marine park (Montego Bay Marine Park Trust) has been established. Other local NGOs include the</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p><b>Illegal dumpsites:</b> No major ones.</p> <p><b>Fishing:</b> There are 7 fishing beaches. One by Catherine Hall is well used. Others include Success Farm, Whitehouse and Rosehall.</p> <p><b>Natural coastline:</b> Most of the coastline has infrastructure.</p>	<p>fish, algae growth, physical damage from spear fishing and anchoring of boats, and poor water quality.</p> <p><b>Impacted mangrove wetlands:</b> Not much; minimal mangroves remaining.</p> <p><b>Sedimentation (from upland development):</b> the Great River carries Sediments to the sea.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Sewage treatment plants have been installed to combat the sewage problem.</p> <p><b>Ground water contamination: (pollution and salt water intrusion):</b> Isolated cases of organic load in inland areas.</p> <p><b>Sand extraction from beaches and dunes:</b> Occasional sand quarrying and erosion at Whitehouse fishing beach; occasional sand removal from Great River.</p> <p><b>Squatter occupancy:</b> Quite a problem; many squatter communities in and around Montego Bay (mostly in the hills). Examples include Rose</p>	<p>GMRDC and the Montego Bay Chamber of Commerce.</p> <p><b>Recreation potential:</b> Montego Bay is the tourist capital of Jamaica; it is also a major cruise ship stopover point.</p> <p><b>Mariculture potential:</b> None.</p> <p><b>Ecotourism:</b> Potential exists.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>Heights, Flankers, Retirement and Norwood.</p> <p><b>Other:</b> Landslide potential in Providence. There is a problem of public access to good quality beaches.</p>	

## HANOVER

### Overview

The coastal area of Hanover extends from the Great River to Long Bay and includes a large portion of the Negril Morass. Deciduous forest vegetation is also found along the coast. Land use includes housing, agriculture, cattle rearing and tourism. Urban and rural residential use is significant, especially in the towns of Lucea Harbour, Hopewell and Green Island Harbour. The main crop cultivated is sugar cane, with a relatively small amount of coconut planted near Great River Bay. Negril has 53 hotel accommodations, with 3,405 rooms and 6,898 beds. Although there are only six public bathing beaches, the entire portion of the Negril beach can be used for recreation. In 1999, the population of Hanover is estimated to be 67,800. A major highway is currently being constructed to connect the resort towns of Negril and Montego Bay.

In Lucea, there are two factories, built and rented out to manufacturers of garments and baseballs, plus a meat processing plant. The Port of Lucea is no longer in active use. The Ministry of Agriculture uses the Green Island Harbour as an oyster culture station. There are six public bathing beaches and eleven fishing beaches in Hanover, and the fishing industry is quite active.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Negril Morass, Long Bay and Bloody Bay are important marine habitats, and are also of great economic importance to Negril's tourism sector.</p> <p><b>Rare and endangered species:</b> Royal Palm stand and the West Indian Whistling Duck, both in the Negril Morass.</p> <p>In Bloody Bay, turtles and manatees have been reported.</p>	<p><b>Existing:</b> The Negril Royal Palm Reserve is a wildlife sanctuary within the Negril Morass. A Negril Marine Park and Negril Environmental Protection Area have been declared.</p> <p><b>Proposed:</b> Bloody Bay and Green Island Bay are among sites proposed for protection.</p>	<p><b>Tourism and recreation:</b> Tourism and recreation predominate; Negril has extensive hotel accommodations, with 3,405 rooms and 6,898 beds. Recreation also occurs by the near shore cays, such as Booby Cays.</p> <p><b>Industry and industrial port:</b> Lucea has a port that is used extensively for molasses and rum export/import.</p> <p><b>Illegal dumpsites:</b> Solid waste is a major problem.</p>	<p><b>Degraded water quality:</b> Water quality is not a critical problem at the current time, but conditions are present for this problem to occur with increasing development.</p> <p><b>Coastal erosion:</b> Minimal.</p> <p><b>Damaged and threatened reef systems:</b> Damaged by tourism activities and agricultural run-off.</p> <p><b>Impacted mangrove wetlands:</b> Some losses due to the North Coast highway development project.</p> <p><b>Sewage pollution (from</b></p>	<p><b>Local NGO activity/ active public involvement:</b> Negril Coral Reef Preservation Society (NCRPS); Negril Area Environmental Protection Trust (NEPT); Negril and Green Island Local Planning Authority (NGILPA) representing both Hanover and Westmoreland.</p> <p><b>Recreation potential:</b> Negril is a major growth pole for recreational activities and tourism development.</p> <p><b>Mariculture potential:</b> Potential for mariculture in Green Island Harbour; some</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>Some dumping still occurs at Bamboo, and at Mount Pelier.</p> <p><b>Fishing:</b> This is an important activity as evidenced by the 14 fishing beaches. Bloody Bay, Orange Bay and Sandy Bay are examples.</p> <p><b>Natural coastline:</b> The Hanover coast contains natural areas along Orange Bay, Green Island and Hopewell.</p>	<p><b>point and non-point sources):</b> Sewage treatment plants have been installed to combat the problem.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> No reported instances.</p> <p><b>Sand extraction from beaches and dunes:</b> Occasional sand removal is being taken from the Bloody Bay beaches; sand removal takes place in Johnson Town.</p> <p><b>Squatter occupancy:</b> Not a major problem, as combated somewhat with the government's Operation PRIDE housing developments.</p>	<p>discussion of sending fishermen to St. Lucia to learn more about the growing of sea moss.</p> <p><b>Ecotourism:</b> Potential exists.</p>



## WESTMORELAND

### Overview

The coastal area of Westmoreland extends from the midpoint of the Negril Great Morass to Scott's Cove. Deciduous forest vegetation is found in the coastal area along with agricultural activities and housing. The main crop is sugar cane, but a small amount of cattle rearing takes place. Urban housing is concentrated around the capital, Savanna-la- Mar. In 1999, the population of Westmoreland was estimated to be 139,900.

Around half of Negril's seven miles of white sand beach is within Westmoreland's coastal area and is used for local recreational as well as tourism purposes. Negril has 53 hotel accommodations, with 3,405 rooms and 6,898 beds. Expansion of tourism facilities is planned for the Negril area.

The fishing industry is very active with fifteen fishing beaches in use, and six public bathing beaches. Other industrial use is limited. One factory has been built in Paradise Cove. The port of Savanna-la-Mar handled no cargo between January and March 1985, but during the similar period in 1984, sugar was shipped from this port.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Negril Morass, Long Bay Beach, extensive good quality reef systems offshore.</p> <p><b>Rare and endangered species:</b> sea turtles, coneys, and yellow snake.</p>	<p><b>Existing:</b> The Negril Marine Park and the Negril Environmental Protection Area have been declared.</p> <p><b>Proposed:</b> Bluefields Bay/Morass and Sweet River Water are among those sites proposed for special protection.</p>	<p><b>Tourism and recreation:</b> Only in the Negril, Bluefields-Whitehouse area. Recreation also occurs on the near shore cays, such as Booby Cays.</p> <p><b>Industry and industrial port:</b> Industries include a meat processing plant, and ackee processing, plus spice production.</p> <p><b>Illegal dumpsites:</b> One example is at Smithfield.</p> <p><b>Fishing:</b> Fishing is an important activity as evidenced by the existence of</p>	<p><b>Degraded water quality:</b> Agricultural run-off and factory waste pollutes the Cabarita River and freshwater wetlands.</p> <p><b>Coastal erosion:</b> Cyclical; both accretion and erosion occur at various times of the year.</p> <p><b>Damaged and threatened reef systems:</b> Some damage due to agricultural run-off and tourism activities.</p> <p><b>Impacted mangrove wetlands:</b> Noted in and around the Cave area.</p>	<p><b>Local NGO activity/ active public involvement:</b> Bluefields Peoples Cooperative, Negril Coral Reef Preservation Society (NCRPS) and Negril Area Environmental Protection Trust (NEPT).</p> <p><b>Recreation potential:</b> High recreational potential.</p> <p><b>Mariculture potential:</b> Some potential for mariculture in the Cave area.</p> <p><b>Ecotourism:</b> This area has good potential for ecotourism and two hotels, Culloden and</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>14 fishing beaches. Whitehouse is one of the more prominent fishing beaches. Other examples include Brighton, Smithfield and Ironshore.</p> <p><b>Natural coastline:</b> Fair portion is in a natural state.</p>	<p><b>Sedimentation (from upland development):</b> the South Negril River transports Sediments.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Sewage treatment is inefficient in Savannah-La-Mar.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Cases linked to occurrence of typhoid. Isolated elevated coliform levels.</p> <p><b>Sand extraction from beaches and dunes:</b> Sand removal from Hope Wharf, and some from Little Bay.</p> <p><b>Squatter occupancy:</b> Not a major problem. Mostly occurs on Government land. Examples include areas near to Bluefields and in the town of Savannah-La-Mar.</p> <p><b>Other:</b> Sometimes serious flooding occurs. Shoreline at Belmont is prone to flooding. Storm surge potential at Whitehouse.</p>	<p>Auchindown are actively pursuing it (at White House and Mt. Edgecomb). Paradise Park (some mangroves) has tourism potential; there is also an opportunity to foster river related recreation, both bathing and fishing. Whitehouse and Scott's Point are important fishing areas.</p> <p>Reduced Removal of sand.</p>

**SAINT ELIZABETH**

## Overview

The coastal area of St. Elizabeth extends from Scott's Cove to Alligator Pond Bay. The largest portion of this region is covered by the Black River Morass, a combination of coastal and non-coastal wetlands. Large portions of the coastal area are also covered by deciduous forest. The Black River, which drains the Morass and is the largest river in Jamaica, is used for waste dilution, (especially dunder from sugar factories), and supports an important artisanal fishery, which produces an estimated J\$3 million per year. Large land areas are utilized for rice and sugar cultivation, and other tracts of land are covered with coconuts, and mixed farming. Smaller areas are utilized for rural housing and there is some tourism activity around Black River Bay. There are nine public bathing beaches and nine fishing beaches in the parish. Saint Elizabeth has four hotel accommodations. In 1999, the population was estimated to be 148,900. Port Kaiser, near the border with Manchester, is an industrial area, from which alumina is exported, while oil and caustic soda are imported. In 1999, Port Kaiser handled 110 cargo ships.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Wally Wash Pond, Hilltop, Lover's Leap, Southfield. Black River where crocodiles are located, and Font Hill, where both crocodiles and sea turtles are located.</p> <p><b>Rare and endangered species:</b> Sea turtles, crocodiles, and the West Indies Whistling Duck are examples of fauna.</p> <p>Examples of flora include orchids, and endemic palms: <i>Roystonea princeps</i> (Royal Palm) and <i>Sabal jamaicensis</i> (Bull thatch).</p>	<p><b>Existing:</b> None.</p> <p><b>Proposed:</b> Font Hill/Luana Wildlife Sanctuary. Lower and Upper Morass; Black River (now a RAMSAR site).</p>	<p><b>Tourism and recreation:</b> Tours are conducted along the Black River, where one of the highlights is viewing crocodiles. Other attractions include YS falls, Bamboo Avenue, Lover's Leap and Treasure Beach.</p> <p><b>Industry and industrial port:</b> Bauxite mining &amp; export at Port Kaiser; Alpart processing plant at Nain; Appleton sugar factory &amp; distillery; sand and clay mining at Hodges.</p> <p><b>Illegal dumpsites:</b> There are reports of dumping along the Font Hill roadside. Other problem areas include along the Crane road, across from the Bridgehouse Inn (behind</p>	<p><b>Degraded water quality:</b> Impact used to result from the input of dunder from Appleton, and waste from the fish farm at Elim.</p> <p><b>Coastal erosion:</b> Due to mining of beach sand, can lead to coastal erosion.</p> <p><b>Damaged and threatened reef systems:</b> Due to high sedimentation/siltation coming from the Black River, the reefs are in an unhealthy state.</p> <p><b>Impacted mangrove wetlands:</b> Mangroves under pressure from charcoal burning. Inappropriate construction took place on Font Hill beach; in the</p>	<p><b>Local NGO activity/active public involvement:</b> Saint Elizabeth Environment Protection Association (SEEPa), and South Coast Resort Board.</p> <p><b>Recreation potential:</b> The south coast generally, and St. Elizabeth, has an allure for those persons seeking something more than the usual sea, sun and sand.</p> <p>There is potential for Heritage tourism, especially as Black River was once very prosperous, and was the first town to get electricity (for example, the Invercauld Hotel is a National monument.)</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>the mangroves), and by Round Hill.</p> <p><b>Fishing:</b> Fishing for shrimps in Black River; deep-sea fishing occurs from several beaches, such as Treasure Beach, Parottee and Calabash Bay.</p> <p><b>Natural coastline:</b> Quite extensive.</p>	<p>morass, white and red mangroves logged by few individuals.</p> <p><b>Sedimentation (from uplands development):</b> Since the river was dyked, there is a high sediment load.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Virtual absence of sewers; towns' and institutions' facilities inadequate or absence.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Pollution from Appleton and Alpart (dunder), although efforts are now underway to try and address the dunder problem. Isolated cases of elevated coliform levels.</p> <p><b>Sand extraction from beaches and dunes:</b> Illegal sand mining from Galleon Beach; legal sand mining behind beach in Great Bay. Sand removal from Crane bathing beach.</p> <p><b>Squatter occupancy:</b> Squatting common, especially on lands owned by PCJ, UDC and central government.</p>	<p><b>Mariculture potential:</b> Not likely.</p> <p><b>Ecotourism:</b> Font Hill, if properly regulated and managed, could be used for bird watching. The Black River could be considered as a possible ecotourism venture, if emphasis is placed on other aspects of the tour rather than focusing predominantly on the crocodiles.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>Announcement of proposed Beaches all-inclusive attracted squatters to Whitehouse/Bluefields coast.</p> <p><b>Other:</b> Flood potential in areas east and west of Black River. Destructive storm potential at Whitehouse.</p>	

## MANCHESTER

### Overview

The coastal area of Manchester is located between Alligator Pond Bay and the Alligator Hole River. There is little development along the Manchester coast, and the area is covered with deciduous forest stands and wetlands. Near the border with St. Elizabeth, there is some extensive mixed farming. Alligator Pond is a local fishing and recreational centre. There are three public bathing beaches and three fishing beaches in the parish. Manchester has five hotel accommodations. In 1999, the population was estimated to be 185,900.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Canoe Valley.</p> <p><b>Rare and endangered species:</b> Captured manatees in Canoe Valley, manatees also sighted offshore; American crocodiles; six species of fish found on reefs.</p>	<p><b>Existing:</b> None.</p> <p><b>Proposed:</b> Canoe Valley proposed for consideration as a national park</p>	<p><b>Tourism and recreation:</b> Yes, Hotels are present.</p> <p><b>Industry and industrial port:</b> None.</p> <p><b>Illegal dumpsites:</b> Much illicit dumping occurs, especially as the Martin's Hill dumpsite is not functioning at a satisfactory level. Other areas include along the main road, going to Balaclava, and in Christiana going towards Devon.</p> <p><b>Fishing:</b> There are only three fishing beaches at Guts River, Hudson Bay and Alligator Pond.</p> <p>Alligator Pond is a major fishing beach.</p>	<p><b>Degraded water quality:</b> No reported water quality problems.</p> <p><b>Coastal erosion:</b> Status not known.</p> <p><b>Damaged and threatened reef systems:</b> No adverse impacts reported.</p> <p><b>Impacted mangrove wetlands:</b> Mangroves impacted by cutting for charcoal burning, yam sticks.</p> <p><b>Sedimentation (from uplands development):</b> No rivers flowing to sea.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Groundwater very deep.</p>	<p><b>Local NGO activity/ active public involvement:</b> Jamaica Junior Naturalists (JJN).</p> <p><b>Recreation potential:</b> Some potential for development of bathing beaches at Alligator Pond and Guts River.</p> <p><b>Mariculture potential:</b> None.</p> <p><b>Ecotourism:</b> The potential exists for an ecotourism venture at Canoe Valley, but the issues of land ownership would first need to be resolved. Also scenic areas such as Guts River.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p><b>Natural coastline:</b> Little infrastructure along coast.</p>	<p><b>Ground water contamination (pollution and salt water intrusion):</b> Groundwater very deep.</p> <p><b>Sand extraction from beaches and dunes:</b> None.</p> <p><b>Squatter occupancy:</b> Minor problem.</p> <p><b>Other:</b> Flooding potential on the coast west of Old Woman's Point.</p>	

## CLARENDON

### Overview

The boundaries of the Clarendon coastal area are from the Alligator Hole River on the west and Bower's River on the east. The area between Carlisle Bay and Milk River Bay is heavily used for growing sugar cane. Smaller areas are used for cultivating tobacco and intensive mixed farming. At Mitchell Town, there used to be a station for the culture of freshwater fish, and there is a salt pan for the manufacture of solar salt. Recreational and tourism activities are limited; Clarendon has two hotel accommodations. Jackson's Bay and Welcome Beach are popular beaches used by the public, but neither has any public beach facilities. There are two public bathing beaches and eight fishing beaches in the parish. The Milk River Spa is located in the parish. There are small pockets of rural residential areas. In 1999, the population was estimated to be 227,500. Two ports on the Clarendon coast are Salt River and Rocky Point. The former is not in active use. Rocky Point, however, is used for exporting alumina, discharging general cargo, and importing oil and caustic soda. In 1999, 65 ships used the Rocky Point port.

Jamaica's largest watershed drains into the Rio Minho, which is Jamaica's longest river. There are large mangroves on the Clarendon coast, and the area has one of the largest stands of mangroves. The waters off the Clarendon coast have large expanses of seagrasses and coral reefs, which makes the Clarendon coast an important fish nursery area. There are also about one dozen coral cays.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Portland Ridge dry limestone forest: high in endemic species. Extensive seagrass beds, coral reefs offshore; cays and wetlands: (mangroves/ salt marshes).</p> <p><b>Rare and endangered species:</b> West Indian manatees, sea turtles, American crocodiles, and breeding colony of seabirds, cave frog, coney, blue tail gallowasp and bats.</p>	<p><b>Existing:</b> Portland Bight Protected Area (includes Portland Ridge, Braziletto Mountains and Kemp's Hill.) Deep Creek Game Sanctuary.</p> <p><b>Proposed:</b> It is proposed that the area be zoned to offer additional protection by creating species management areas, habitat management areas, and national nature reserves in the wetlands and the nearshore cays.</p>	<p><b>Tourism and recreation:</b> Minor, although there is some hunting from the three major gun clubs: PWD, Monymusk and Jackson's Bay (bird and fish provide game for hunters).</p> <p><b>Industry and industrial port:</b> JAMALCO bauxite/ alumina plant at Halse Hall, and the Rocky Point bauxite port. The Vere plains are dominated by sugar estates (Monymusk and Yarmouth), and there is one sugar factories and two major rum</p>	<p><b>Degraded water quality:</b> Some potential danger of pesticide contamination from agricultural runoff. Nutrient enrichment also a problem. Some leakage from the Red Mud Lake.</p> <p><b>Coastal erosion:</b> Reported to be a problem.</p> <p><b>Damaged and threatened reef systems:</b> Some areas of the reefs showing severe signs of eutrophication.</p>	<p><b>Local NGO activity/ active public involvement:</b> Caribbean Coastal Area Management Foundation (CCAM), and the Clarendon Tourism Development Foundation (CTDF).</p> <p><b>Recreation potential:</b> Areas within the Portland Bight Protected Area, in particular: the West Harbour Mangroves, Boggy Pond and Cockpit Salt Marsh. Other examples include the Milk River Mineral Spa and Canoe Valley. In general, coastal</p>



Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
		<p>distillery. Limestone mining has been proposed on a large scale for the Braziletto mountains. A major lime plant, operated by Rugby International, is in operation at Halse Hall.</p> <p><b>Illegal dumpsites:</b> Mineral Heights is one example.</p> <p><b>Fishing:</b> Important as a fish nursery area, and fishing ground. There are about 8 fishing beaches which include Rocky Point (the third largest fishing beach), Portland Cottage and Farquhars beach.</p> <p>Rocky Point is the closest landfall to the offshore Pedro Banks, which are very important. Mackerel Bank lies just beyond the island shelf (Bowden Bank).</p> <p><b>Natural coastline:</b> Much of the coastline is in its natural state, and therefore performs important ecosystems functions.</p>	<p><b>Impacted mangrove wetlands:</b> Mangroves reportedly threatened.</p> <p><b>Sedimentation (from uplands development):</b> Reported to be a problem.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Information not available.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Mostly agricultural run-off. South Clarendon Plains show saline influence.</p> <p><b>Sand extraction from beaches and dunes:</b> Sand quarrying a major problem, especially in the Rio Minho bed.</p> <p><b>Squatter occupancy:</b> A major problem along the Rocky Point Fishing beach. Examples of other squatter areas include: on Sevens Road, and in the Buckshaven area.</p> <p><b>Other:</b> Destructive storm surge potential west of Milk River. Potential for flooding along the coast and in areas around Rio Minho. Flooding</p>	<p>areas offer tremendous recreation potential.</p> <p><b>Mariculture potential:</b> No plans.</p> <p><b>Ecotourism:</b> Potential exists, particularly in Portland Bight.</p> <p>Mostly legal quarrying on Rio Minho coupled with river training exercise.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>in Mitchell Town and Rocky Point. Oil, and other chemical spills from the JAMALCO port, and the alumina dust from the port operations are also issues of concern. Overfishing is a problem. That bird hunting and fishing may not be sustainable is suggested by the low returns on the effort and during the hunting season. Fires in coastal forest, especially in Portland Ridge, usually in association with ganja cultivation, and charcoal burning in the Braziletto mountains.</p>	

## SAINT CATHERINE

### Overview

This parish is bounded by Bower's River to the west and the Ferry River to the east. Deciduous and wetland vegetation predominates, and the principal land uses are agricultural and residential. The major crop is sugar cane, but some intensive mixed farming occurs in the more inland areas. The coast of Saint Catherine is dominated by large expanses of mangrove wetlands, the Great Salt Pond to the east, and the Cabaritta mangal and Galleon Harbour in the west. There are five small coral islands that are sometimes visited by pleasure seekers. This coastal area contains the largest fishing beach in Jamaica, Old Harbour Bay, which handles around 8% of annual inshore landings. There are three fishing beaches and four public bathing beaches in the parish. Hunt's Bay is used for shrimp fishing.

The major residential area is Portmore, which is built largely on reclaimed wetlands, and is now the second largest urban centre on the island. In 1999, the population of Saint Catherine was estimated to be 411,600. The Amity Hall swamp used to be used for rice cultivation. Hellshire Hills is of tremendous ecological importance, as it is the largest remaining stand of relatively intact dry limestone forest in Central America and the Caribbean. Hellshire Hills to the west of Portmore is gradually being developed by the UDC, and both the Portmore and Hellshire developments are intended to accommodate the growing housing needs of the greater Kingston Metropolitan Area. Only one hotel accommodation is located in the parish.

The Hellshire beach has evolved as a major recreational area for the residents of Kingston and St. Catherine, especially with the development of Fort Clarence and access to Half Moon Bay and Engine Head. Port Esquivel, near the border with Clarendon, is a busy port handling the export of alumina, the discharge of general cargo and fuel oil, and the import of oil and caustic soda. In 1999, Port Esquivel handled 140 cargo ships. Texaco operates an oil storage facility near the port.

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p><b>Important habitat area:</b> Hellshire Hills; Cabarita Swamp; Great Salt Pond; Old House Point Lagoon; causeway and mangrove wetlands, cays, coral reefs and seagrass beds.</p> <p><b>Rare and endangered species:</b> Jamaican Boa, Thunder snake, crocodiles; Hellshire Hills contains 271</p>	<p><b>Existing:</b> Most of the Saint Catherine coast falls within the Portland Bight Protected Area. Amity Hall and Goat Island Game sanctuaries.</p> <p><b>Proposed:</b> Dawkins Pond is under consideration for inclusion in the list of Protected Areas. It is proposed that the area be zoned to offer additional</p>	<p><b>Tourism and recreation:</b> Hellshire beach is the most popular in the Kingston Metropolitan Area. Other than Hellshire beach, there is not much tourism in the parish.</p> <p><b>Industry and industrial port:</b> Port Esquivel, used for shipping of alumina and the importation of caustic soda,</p>	<p><b>Degraded water quality:</b> Water quality is poor as a result of current flow from the Kingston Harbour. Rio Cobre, which passes through the industrial estate of Twickenham Park, is one of the most heavily polluted rivers in Jamaica. This impacts negatively on Dawkin's Pond. Many industries dump their</p>	<p><b>Local NGO activity/ active public involvement:</b> Caribbean Coastal Area Management Foundation (CCAM), Portmore Environmental Protection Trust.</p> <p><b>Recreation potential:</b> Potential for recreational development at Port Henderson beach and at Fort</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
<p>species of plants, 20 percent of which are endemic to Jamaica; manatees sighted off coast; the Jamaican iguana located in the Hellshire Hills.</p>	<p>protection by creating species management areas, habitat management areas, and national nature reserves in the wetlands and the nearshore cays.</p>	<p>and other general cargo, heavily impacts the surrounding environment. Thermal pollution is a concern of the JPSCo's cooling operations. Sugar industries (Bernard Lodge and Innswood ) are found on the Saint Dorothy's Plains.</p> <p><b>Illegal dumpsites:</b> Dumping of solid waste occurs along the causeway. Lakes Pen is an example.</p> <p><b>Fishing:</b> Fishing is actively pursued at Old Harbour Bay village and at Hellsinki village (a squatter community).</p> <p>Port Henderson and Hellshire are other examples.</p> <p><b>Natural coastline:</b> There are considerable stretches of natural coastline.</p>	<p>wastes (such as pulp and chemicals) into the river, therefore causing eutrophication downstream.</p> <p><b>Coastal erosion:</b> Erosion is a problem at Hellshire beach.</p> <p><b>Damaged and threatened reef systems:</b> There is great concern over damage to coral reefs.</p> <p><b>Impacted mangrove wetlands:</b> Potential impacts from development pressure.</p> <p>The Hillrun area of the parish has lots of fish farms, and the waste goes into the Salt Island Creek (which enters Galleon Harbour behind Goat Island) therefore negatively impacting on the mangroves. The town gully (coming from Spanish Town) also enters the Salt Island Creek.</p> <p><b>Sedimentation (from uplands development):</b> Sediment and debris is carried by the Rio Cobre River entering St. Catherine from Kingston Harbour to the east, and from the Salt Island Creek.</p> <p><b>Sewage pollution (from point and non-point sources):</b> Degraded coastal waters carried from Kingston</p>	<p>Clarence. Heritage tourism potential exists.</p> <p><b>Mariculture potential:</b> None planned at present. Post larvae of <i>Penaid</i> shrimp were being shipped to Panama until recently.</p> <p><b>Ecotourism:</b> Potential exists.</p>

Environmentally Sensitive Areas	Protected Marine & Coastal Areas	Predominant Use	Critical Issues/Problems	Opportunities
			<p>area by ocean currents. Pollution also from Rio Cobre and leaching from soak aways.</p> <p><b>Ground water contamination (pollution and salt water intrusion):</b> Saline intrusion a problem. Localized cases of elevated sodium levels in bauxite area.</p> <p><b>Sand extraction from beaches and dunes:</b> Sand is occasionally taken from the Hellshire beach.</p> <p><b>Squatter occupancy:</b> Squatting occurs along the causeway, similar to what takes place in Kingston. Squatting also occurs along the banks of the Rio Minhó.</p> <p><b>Other:</b> Danger of thermal pollution from plant in Old Harbour. Destructive storm surge potential in Galleon Harbour. Threat from pesticides and fertilizers used for the sugar industries. Overfishing and dynamiting. The habitat of Hellshire Hills is under threat from housing development.</p>	

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