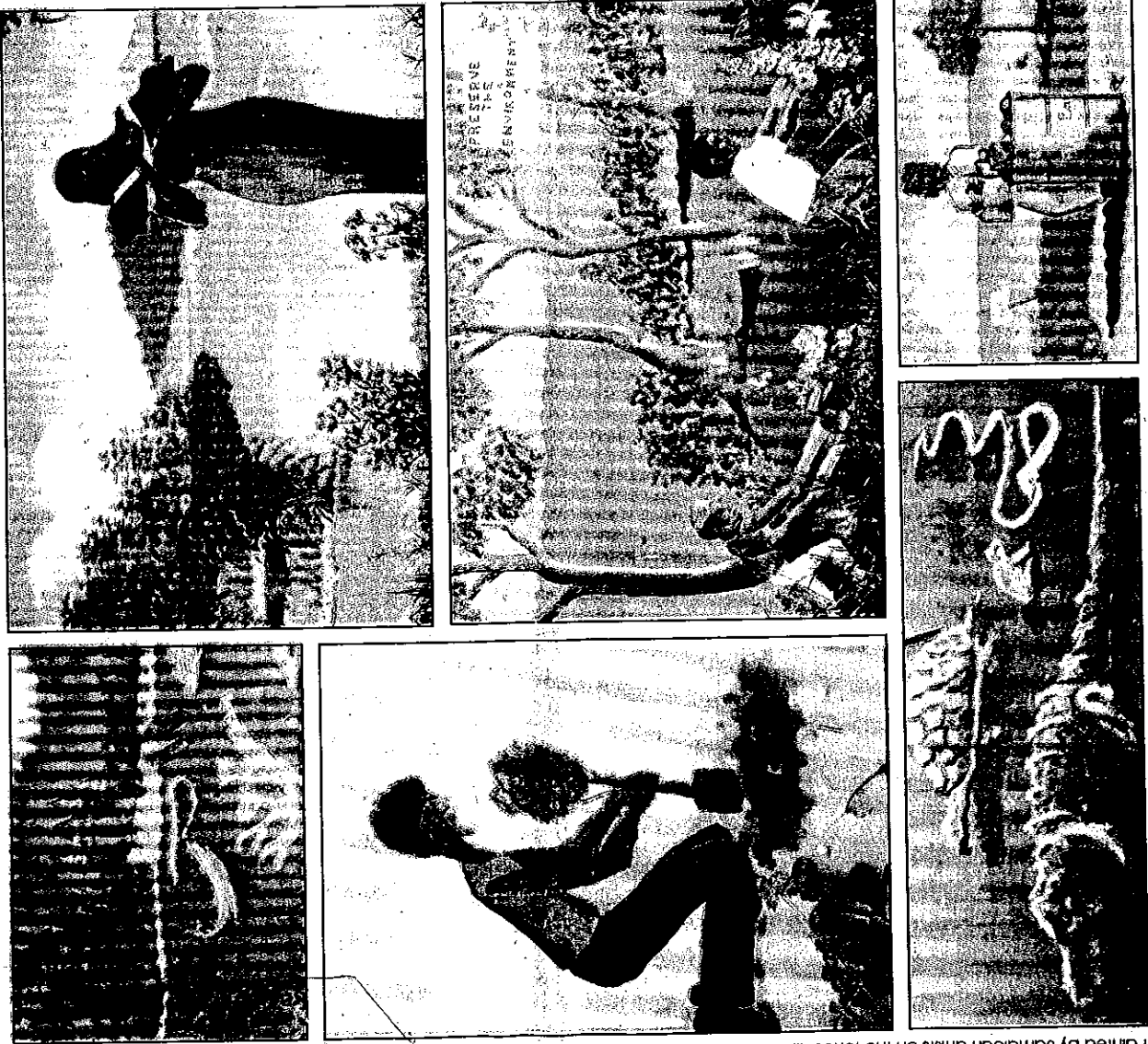


S.L.'s office

Jamaica STATE OF THE 1995-96 ENVIRONMENT

Celebrating the Fifth Anniversary of the NRCA & Environmental Awareness Week



Painted by Jamaican artists on the fence around Life of Jamaica/Montego Bay Shopping Centre construction site, 1993

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NATURAL RESOURCES CONSERVATION AUTHORITY

INTRODUCTION

The purpose of the State of the Environment (SOE) Report is to provide readily available information on an annual basis about Jamaica's environment and natural resource use. It outlines in summary the nation's environmental agenda and provides a basis for the public to participate in development planning and environmental protection. In future years, the SOE will record progress towards meeting identified targets.

This first State of the Environment Report covers the present state of the economy relative to the country's natural resources. It summarizes institutional roles and programmes and indicates the priorities and strategies of the principal environmental management institutions. The Natural Resources Conservation Authority is responsible for preparing the SOE in collaboration with other regulatory and resource management agencies and in consultation with academic, research, and non-governmental organizations.

PART 1

Jamaica's Response to Environmental and Development Issues

ESTABLISHMENT OF AN ENVIRONMENTAL MANAGEMENT FRAMEWORK

Before independence the Crown was responsible for protecting and managing Jamaica's natural resources through various government ministries and statutory organizations. The passing of the Harbours Act in 1874, prohibiting pollution of selected marine waters, demonstrated an early concern for the environment. From then up to the 1960's a variety of laws related to natural resources were passed, including the Forest Act (1937), Mining Act (1944), Wildlife Protection Act (1945), and the Beach Control Act (1956). These were chiefly geared towards regulating the exploitation of natural resources. Specialized institutions were established to administer these laws.

By the early 1960's there was growing awareness of environmental degradation. Passage of the Town and Country Planning Act (1958), Clean Air Act (1961), and Watershed Protection Act (1963) symbolized government's response to the need to shift from exploitation to stronger development controls and management of natural resources. New committees, authorities, and commissions emerged which, along with those that already existed, shared responsibilities for the variety of environmental laws in effect. This institutional network suffered from shortages of technical staff, overlapping responsibilities, and lack of coordination. The result was a fragmented and often ineffective approach to environmental management.

The 1970's brought needed change. The Ministry of Mining and Natural Resources was created in 1972. Its responsibilities included many environmental laws and regulations as well as oversight for the various authorities and commissions empowered to administer them (the Beach Control Authority, the Watershed Protection Commission, and National Parks and Wildlife Committee, etc.). This marked the beginning of a more coordinated approach to environmental management.

The momentum generated by the Stockholm Conference on the Environment in 1972 culminated in 1975 in the formation of the Natural Resources Conservation Department (NRCD) within the Ministry of Mining and Natural Resources. The NRCD

became the umbrella environmental management agency with a broad mandate to protect environmental quality. At the same time the Environmental Control Division (ECD) was formed within the Ministry of Health and Environmental Control to focus on pollution control and occupational health. Both the NRCD and ECD were included on the Town and Country Planning Authority in an effort to include environmental considerations in the development control process.

By the 1980's it was clear that a more comprehensive framework for environmental management was necessary, as well as a stronger NRCD. As a result, the Natural Resources Conservation Authority was established by the NRCA Act in June of 1991. Its function was broadly defined "to take such steps as are necessary for the effective management of the physical environment of Jamaica so as to ensure the conservation, protection, and proper use of its natural resources."

SUSTAINABLE DEVELOPMENT

The 1990's saw Jamaica joining the rest of the world in embracing the concept of "sustainable development". By this is meant meeting human needs and providing for continued economic growth while not compromising the earth's ability to continue doing so for future generations. Jamaica's aspirations towards environmentally sustainable development are demonstrated in the passing of the NRCA Act and the policies, institutional arrangements, programmes, and projects which followed.

The 1992 United Nations Conference on the Environment and Development (UNCED) in Brazil, like the Stockholm Conference twenty years earlier, was a milestone. Out of it came Agenda 21, a comprehensive blueprint for the global and local actions required for the transition to sustainable development. Agenda 21 helped set the framework for the Jamaica National Environmental Action Plan (JANEAP) 1995. The JANEAP measures progress, sets priorities and identifies actions to guide national policies, programme planning, investment decisions and budget preparation.

There are many constraints on the path to sustainable development. These include inadequate legislation, uncoordinated

planning inadequate levels of public awareness, illiteracy and poverty. The erosion of traditional values and attitudes that uphold nature and the introduction of new high consumption lifestyles also are major obstacles.

Still, progress is being made. To start with, the NRCA, after just five years of existence, continues to provide national leadership on the environment. This is evidenced by:

- wide acceptance of the Environmental Assessment process, and public participation in it, as a key prerequisite to major development activity;
- acceptance and public support for a national system of parks and protected areas, with two operational (Montego Bay Marine Park and Blue Mountain John Crow Mountains National Park) and more than ten other areas under study;
- creation of a National Environmental Education Committee, opening of the NRCA's Documentation Centre, and work with numerous target groups (teachers, students, farmers, fishermen, NGO's, etc.);
- coastal zone management policies, regulations and development guidelines for beaches, mangroves, coral reefs and mariculture, and
- standards for trade effluent and ambient air quality.

The NRCA cannot meet the challenge alone. As Agenda 21 clearly states, the path to sustainability requires partnerships and sharing of responsibilities. Support continues to come from agencies and institutions throughout the public sector and from the civil society. Examples include:

- coordinating mechanisms amongst government agencies, including the Inter-Ministerial Committee on the Environment, and the various Inter-Agency Technical Advisory Committees on the Environment;
- the new National Industrial Policy which recognizes the essential complementarity between environmental and industrial policy, and the linkages between the environment, social and economic development;
- the National Water Commission's major sewage projects in Negril, Montego Bay and Ocho Rios to protect each area's marine environment and tourism based economy;
- the launching of Operation PRIDE to meet the needs for land by people, and helping to reduce informal developments on wetlands, steep slopes and other inappropriate areas

- ongoing local government reforms where Parish Councils are being empowered to assume environmental management responsibilities as they relate to local planning and provision of services, and

- leadership by Tourist Action Plan to develop sustainable tourism initiatives and ecotourism as a means of promoting both development of the sector and environmental protection.

The growing NGO movement, and the activities of the business community complement and support the work of government. This is evident through:

- the growth and leadership of national NGOs such as the National Environmental Societies Trust and the Jamaica Conservation and Development Trust; and the continued work of long established groups such as the Natural History Society and Gosse Bird Club.
- the establishment of the Environmental Foundation of Jamaica to develop capacity in the NGOs and finance local environmental activities (74 projects valued at J\$42.39 million over the past two years);

- the emergence of local environmental NGOs across the country, such as the Portland Environmental Protection Association and Negril Environmental Protection Trust, (a continuing process as the recently created Southern Trelawny Environmental Agency illustrates);

- hotels adopting "green tourism" practices such as waste reduction, recycling, and composting procedures that reduce the amount of garbage that goes to the landfill, and

- large and small businesses contributing funds, commodities, and services to community led environmental improvement projects.

Finally, many individuals across the country have joined in the effort. Teachers guide students in understanding the importance of local wetlands. Children clean up beaches and become junior rangers. New parents revive deep traditions by planting a tree with the birth of a child. Farmers minimize their use of chemicals. More citizens are being volunteer NRCA Game Wardens. Land developers avoid cutting down trees along gullies to minimize erosion. Consumers avoid buying products which have excessive packaging. The list goes on and on, as Jamaicans realize that individually and collectively they need to take action and make choices which take the environment into consideration. This is the path to environmentally sustainable development.



There will always be children who love to play on beaches. Will there always be clean, accessible beaches for future children to play on?

Photo courtesy of Jampies LTD.



What can we do?

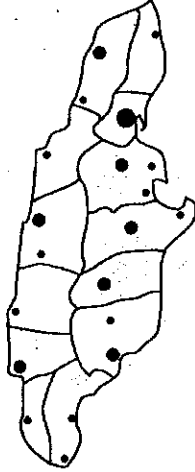
Remember the 3 R's.

- **Reduce:** While we want every Jamaican to read this State of the Environment Report, only a limited number could be printed. Thus we all need to share and make the best use of each copy.
- **Re-use:** When you are finished with your copy, make sure that it is reused by giving it to family or friends, a teacher, or returning it to the NRCA for redistribution.
- **Recycle:** Currently newspaper is not being formally recycled in Jamaica. However, don't let this copy end up in a landfill or gully, or get burned. When your copy is so tattered that it can no longer be used, you can tear it into strips and add it to your yard compost, or use as a water-saving mulch around trees and other plants.

PART 2

Our Natural Resources: Where are we now?

Proposed Major Population Growth Centres in Jamaica



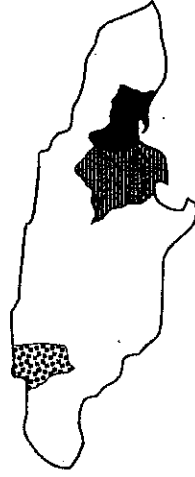
- National Centre
- Regional Centres
- Sub-regional Centres
- 1. Negril
- 2. Savanna-La-Mar
- 3. Santa Cruz
- 4. Lionel Town
- 5. Old Harbour
- 6. Portmore
- 7. St. Thomas
- 8. Buff Bay
- 9. Port Maria
- 10. Browns Town
- 11. Falmouth
- 12. Lucea

Natural resources have always played an important role in economic development. Though attention has been paid to the role of non-renewable resources (minerals and fossil fuels), Jamaicans are now recognizing the wider contribution of the natural environment. This includes the role of non-renewable resources, such as minerals; the use of renewable resources, including forests, soils, rivers and the sea; and the use of lands and waters for waste disposal. Also included are the essential life support functions of ecosystems, a wide range of valuable biological resources, and recreational opportunities for both Jamaicans and visitors. Therefore, development planning must involve comprehensive knowledge of our natural resource base, the functioning of the natural systems, and the social, cultural, and economic factors which influence the use of these resources. The sectors/resource areas highlighted below are selected because of their importance to Jamaica's development.

2.1 POPULATION

There is a clear relationship between population and the environment. As jobs become scarcer, people turn to the natural resource base for their livelihood. The more people there are, the less land there is to support their needs. This places severe stresses on the country's land, water, and energy resources. As a result, the environment is less able to support life and restore itself.

Most Densely Populated Parishes



- > 400 persons per km²: Kingston & St. Andrew
- 300 - 399 persons: St. Catherine
- 200 - 299 persons: St. James

Trends and Indicators

- Jamaica's population was 2.5 million at the end of 1994, an increase of approximately 1.0% over the end of 1993. The crude birth rate rose from 23.2 to 23.7 per thousand in 1993 (the lowest since 1989) while the crude death rate declined from 5.6 to 5.4 per thousand over the year. Migration from Jamaica, which continues to be a significant factor in the country's population growth, declined from 21,300 persons in 1993 to 18,800 in 1994. Despite these changes, the population is expected to remain below 3 million up to the year 2020.

- Average population density at the end of 1994 was 228 persons per km², up from 210 the previous year. Distribution across the island is uneven and is becoming more concentrated in the growth centers of Kingston, Spanish Town, Montego Bay, Mandeville and Ocho Rios.

Issues

- Population growth without providing for housing and for water, waste management, roads, schools and other services, usually results in environmental degradation.
- Limited access to land and other resources continues to lead to squatting and an unwillingness or inability to conserve environmental resources on the part of those who are marginalised.
- The Jamaican environment is already in a fragile state, and is likely to be stressed further unless we all work together to manage our use of resources and develop a strategy for dealing with the growth and distribution of the population.

2.2 SHELTER

The gap between housing demand and supply is great. According to the 1987 National Shelter Strategy Report, to satisfy housing needs, Jamaica needed to build 15,500 new units and upgrade 9,700 units each year to 1990 to eliminate over-crowding, and to build an average of 4,009 new units and upgrade 2,580 units annually to the year 2006. These targets are not being met.

A number of actions have been taken to address this problem. The Government has developed a Land Policy, a draft settlement policy, and a Programme for Re-settlement and Integrated Development Enterprise (Operation PRIDE).

Trends and Indicators

- There were 5,747 officially recorded housing starts in 1992, an increase of 19.5 % over 1991. Of these, the public sector accounted for 3,169 units and the private sector for 2,578 units.
- In 1992, 85 % of Jamaicans lived in single-family detached houses. The rest lived in parts of houses, semi-detached houses, apartments/townhouses or commercial buildings.
- In 1992, 60.2% of officially recorded housing units were owner-occupied, 12.5% were rent-free, 25.2% were rented, 0.8% were squatter-occupied, and 1.3% were listed as other.

Issues

- The high incidence of rural to urban drift both reflects and results in a lower level of investments, facilities and amenities in rural areas.
- Rural settlements are small and scattered, reducing the opportunities for social services to be provided.
- People are less able to buy land and houses because of increases in land prices, building materials, wages, and transportation, and high interest rates affecting mortgage rates.
- More people are squatting on marginal lands, such as wetlands, steep slopes and gully banks, and even gullies themselves, which are unsuitable for shelter and cultivation.



Harbour Street in Kingston during the 1990's. How has it changed in a hundred years?

Photo courtesy of the National Library of Jamaica.

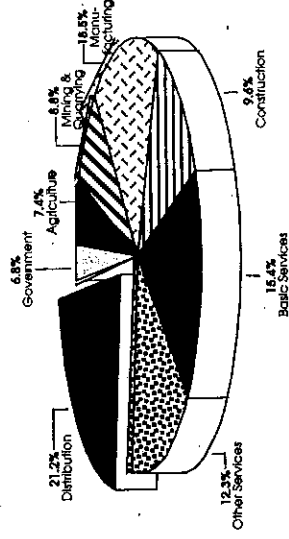
2.3 THE ECONOMY

The transformation of the Jamaican economy from its dependence on sugar and bananas began in the 1950s, with the establishment and growth of the bauxite/alumina sector, manufacturing, and the emergence of tourism. These three sectors still earn the most foreign exchange for the country. Tourism is the principal earner of foreign exchange, with eco-tourism a growing marketing approach. Clearly Jamaica's economy depends on its environment and natural resources.

Trends and Indicators

- The economy grew marginally in real terms during 1994, increasing by 0.8% over 1993.
- High interest rates and increasing competition from imports impeded growth. Agriculture remained the fastest growing sector during 1994. Growth was boosted by continued improvement in domestic crop production.
- The financial services sub-sector has shown dramatic improvement because of liberalization of the foreign exchange market. This trend is expected to continue.
- The labour force increased by 7,500 persons in 1994, averaging 1,090,500. The 10,100 new jobs created resulted in a 5.8% decline in unemployment to 15.4%.
- Real per capita GDP at the end of 1994 was J\$7,263.
- In 1993, approximately 28.2% of all Jamaicans lived below the poverty line, down from 33.3% in 1989.

Sector Contributions to Gross Domestic Product (GDP)



What can we do?

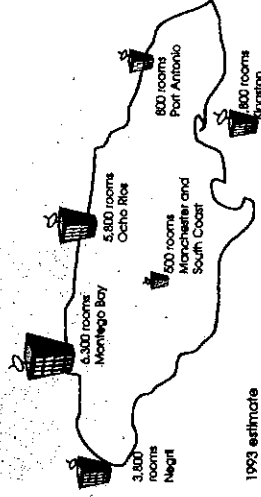
- Practice birth control. Remember that planning family size is the most important way to achieve economic benefits and protect the earth.
- The Government can emphasize environmental protection and sustainable resource use in its revised National Physical Plan.
- Everyone can participate in the preparation of parish development plans to make sure they are relevant to local needs and protect local resources.
- Consumers can make wise choices by buying environmentally friendly products.

Part 2: Our Natural Resources: where are we now?

2.4 TOURISM AND RECREATIONAL RESOURCES

Jamaica's economy has become increasingly dependent on tourism. As an industry, tourism represents great growth potential since it increases foreign exchange earnings and expands employment opportunities. While tourism brings visitors to Jamaica in search of natural beauty and cultural attractions, the dramatic growth of the industry poses special problems to the nation's environment and culture. Tourism underscores the need for environmental and economic planning to be harmonized.

Distribution of Tourist Accommodation (Rooms) at Major Destinations in Jamaica



Trends and Indicators

- Tourism is the second largest contributor to GDP (13.3%), behind manufacturing (16.8%). It is also the largest foreign exchange earner in Jamaica. The industry produced J\$8.3 billion in goods and services in 1992, and earned J\$23.2 million in foreign exchange from tourist expenditures.
 - Direct, indirect, and induced employment in 1992 totalled the equivalent of 217,000 full-time jobs, 23% of the labour force.
 - Within the Caribbean, Jamaica ranks second after the Dominican Republic in terms of the size of the accommodations sector, with 18,500 rooms at the end of 1992.
 - Eco-tourism is the fastest growing sector in the tourism industry globally, though its current contribution to Jamaica's tourism sector is difficult to assess.
 - Recreational facilities include 92 public bathing beaches, 13 government-owned attractions, and a number of privately-owned attractions.
- Many workers migrate to tourist areas in search of jobs. Hotels which provide top quality accommodation for visitors tend to make little or no provision for workers in the industry. The result is expanding squatter communities close to major tourist areas.
 - The tourist industry makes many demands on the environment, such as pressure on beaches, the use of precious resources for craft items, use of wetlands for waste disposal, removal of seagrass beds at swimming beaches and blocking of visual and public access to the coast. These environmental impacts could reduce Jamaica's sustained attractiveness as a tourist destination.
 - There is the growing danger of Jamaica again becoming overly-dependent on one sector. In addition, recreational facilities and attractions too often are developed for tourism at the expense of access and affordability by local residents.

Issues

2.5 CULTURAL AND HISTORIC RESOURCES

Jamaica is rich in historic buildings and monuments, and attracts the attention of archeologists and historians from all over the world. These sites reflect the various colonial and native interactions of our history, and are found in all parishes. Heritage tourism is a relatively new area of interest to Jamaica, and has great potential for diversifying the tourism product, for revenues, and for supporting restoration of historic sites.

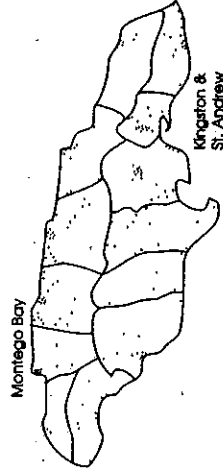
Trends and Indicators

- An estimated 350 registered sites, monuments, and structures exist throughout the island. The Jamaica National Heritage Trust (JNHT), estimates that approximately 7,500 more monuments and structures should be included on the national register.
 - Approximately 350 known Arawak sites exist, though most have not been thoroughly excavated.
 - Spanish Town, a protected heritage district, is also recommended for listing as a World Heritage Site.
- Falmouth, Trelawny has an extraordinary concentration of Georgian architecture and has been designated the first site on the heritage trail.

Issues

- Most buildings declared as national monuments are occupied by private owners, who often find it difficult and costly to maintain them.
- The greatest threats to our national heritage are neglect, lack of funds, and uncontrolled development.

Distribution of Registered National Monuments, Historic and Archeological Sites



Registered sites consist of a variety of aqueducts, bridges and dams, historical buildings, caves and Arawak middens, churches, cemeteries and tombs, clock towers, forts and naval military monuments, lighthouses, public buildings and statues.

2.6 MINERAL RESOURCES

Jamaica's mineral resources include metallic ores such as bauxite, copper and nickel; industrial minerals such as limestone, gypsum, silica sand, marble, sand and gravel deposits; some precious and semi-precious stones such as gold, silver, and platinum. Traditionally, bauxite/alumina has been Jamaica's most important export mineral, though it has been subject to major cyclical fluctuations. Gold and silver occur in association with copper, but not in significant enough amounts to warrant exploitation. Mineral resources therefore have the potential for greater contribution to economic development, but require careful environmental assessments.

Trends and Indicators

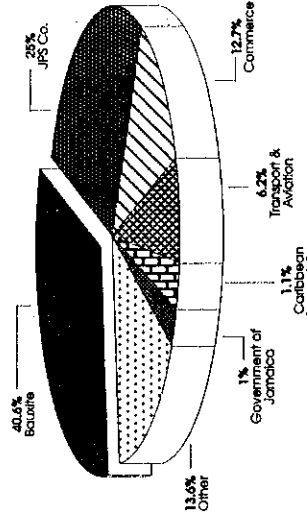
- In 1994, there was an upturn in the bauxite/alumina industry, with production of total bauxite increasing by 2.3% to 11,571,326 tonnes.
- Gypsum production in 1993 was 203,700 tonnes, a 33.8% increase over the 1992 output of 145,000 tonnes.
- Crushed limestone production increased from 3.2 million metric tons in 1992 to 3.3 million metric tonnes in 1994. High purity limestone production increased to 52,359 metric tons in 1994, or by 18.9% over 1993.
- Production of other industrial minerals increased in 1993/94, with silica sand production reaching 21,313 metric tons in 1993, but declining to 18,300 metric tons in 1994.
- The demand for industrial lime is likely to increase as a consequence of environmental clean-up activities in developed countries.

Distribution of Bauxite Reserves



These reserves are found in Clarendon, St. Ann, Manchester and St. Elizabeth. Bauxite has been Jamaica's major mineral export for the past 45 years.

Energy Use by Sector



2.7 ENERGY RESOURCES

In recent years, Jamaica's energy consumption has increased significantly. Energy is needed for essential services such as power for manufacturing and other industrial activity, and fuel for transportation and cooking. The use of oil and coal carries with it a number of environmental problems, such as water and air pollution and contamination of soils.

Trends and Indicators

- 99% of the commercial energy demand is met by imported petroleum and coal.
- During 1994, the Jamaica Public Service Company (JPSCO) supplied 2,340 million kilowatt hours (kWh) of electricity to 366,721 customers legally connected to its grid. This represents an increase in total generation of 3.9% over 1993.
- Very few Jamaicans are using solar power; the most popular application being solar water heating systems. About 1,700 such systems were installed in 1992.

Issues

- Jamaica's indigenous energy resources are limited, with no substitute for imported fuel. The Government is encouraging small hydro projects as the main focus of alternative energy development.
- The Government is encouraging solar energy systems, and has zero-rated the General Consumption Tax (G.C.T.) on solar equipment.
- High priority needs to be given to energy conservation because of scarce foreign exchange, and traditional power generation damages air and water quality.



What can we do?

- Keeping Jamaica free of litter is one way to make the natural beauty more enjoyable.
- Knowing about local culture and historic sites is an important step in protecting them. Find out where they are near you and make sure that your friends and neighbours are aware of their value.
- Report beach sand mining whenever it is observed.
- Mined out limestone quarries are found all over Jamaica. Community groups can work with landowners to explore ways to reclaim and use these abandoned quarries.
- Conserve on energy by keeping lights off when not needed, driving less, car pooling, and saving water.

Part 2: Our Natural Resources: where are we now?

Agricultural Land Suitability



- Land suitable for cultivation with almost no limitation
- Land suitable for cultivation with moderate limitations
- Land suitable for cultivation with strong limitations

2.8 AGRICULTURE

Jamaica is primarily an agricultural country. The sector (including fisheries, forestry and pasture) occupies over half of the country's land area (502,674 hectares of the island's 1,100,784 hectares). Agriculture presently contributes greatly to environmental degradation. This results from the clearing of unstable slopes for cultivation, slash and burn methods often causing forest fires, and poor farming and forestry practices leading to soil erosion and loss of productivity.

Trends and Indicators

- Agriculture continues to be a mainstay of the Jamaican economy, employing 36% of the population.
- Domestic agriculture increased by 9.9% in 1994. Annual domestic production was at its highest since 1978.
- In 1993, total exports increased by 10.7% to US\$196.1 million. Non-traditional exports increased by 21.9% to US\$31.9 million.
- Earnings from traditional crops moved from US\$149.5 million in 1992 to US\$163.1 million in 1993, due largely to an increase in export volumes. Bananas, coconut, and coffee all moved up by a further 12.1%, 18.7%, and 0.7% respectively. However, sugar cane production

declined by 6.2%. For 1994, banana and coconut increased by 2.4% and 4.0% respectively, while sugar cane and coffee declined by 7.9% and 26.2% respectively.

Issues

- Many large areas of arable land are under-utilized and negative social attitudes towards working in agriculture persist.
- Inadequate technology, marketing, and transportation hinder growth in this sector.
- Prevalent landlessness, insecurity of tenure, and lack of credit make it difficult for small farmers to make an adequate living from agriculture.
- Misuse of agricultural chemicals (pesticides and fertilizers) are contributing to water pollution.

2.9 FOREST RESOURCES

Jamaica's 300,000 to 500,000 hectares of forests play a critical role in the country's development. They provide lumber, posts, yam sticks, fuelwood, charcoal, fruits, medicinal plants, rope, drinks, and other consumables. They protect watersheds and therefore enhance water supply, provide habitats for many wildlife species, maintain soil productivity and environmental integrity. They are critical to Jamaica's scenic beauty. Less than 6% (77,000 ha.) is relatively undisturbed. The remainder is listed as badly disturbed (ruinate) secondary forest (169,000 ha.) and plantations (21,000 ha.). Commercial forests are estimated at 267,000 hectares. (44%/state-owned, 56%/private). In 1994 the Government drafted a Green Paper on Forestry, and drafted a bill to update the Forestry Act.

Trends and Indicators

- Forest industries in Jamaica consist of about 180 sawmills, four treatment plants, three moulding/planning plants, one paper mill, numerous furniture workshops, and other craft and fuel activities, employing 29,000 people.
- Approximately 37% of household energy needs are met by fuelwood and increasingly by charcoal.
- Local production of softwoods is about 1% of demand (15% prior to Hurricane Gilbert), while production of hardwoods is about 82% of demand. The effective production of oil lumber is only 20% of total demand, the remainder being met through imports. Demand for poles, posts, etc. is also largely met through imports.

Montego Bay



Kingston

Issues

- Forests are under severe threat due to land clearing for cultivation, fuelwood, and charcoal production. Forest cover is disappearing at 3.3% per year. No recent forest resources inventory exists. Monitoring is inadequate.
- The rate of reforestation must be accelerated.
- The roles of the private sector and NGOs in the forestry industry are not clearly defined.
- The industry will continue to decline unless targets are set to which relevant agencies are held accountable.

2.10 COASTAL AND MARINE RESOURCES

Jamaica's coastline is 885 kilometers (550 miles) long and is highly irregular, with diverse ecosystems, including bays, beaches, rocky shores, estuaries, wetlands, cays and coral reefs. These ecosystems are home to a variety of living creatures, and support numerous economic activities. Coastal ecosystems also protect land-based communities from natural disasters. They are a significant base for the island's economy, mainly in fisheries and tourism. The ocean has an even greater range of ecosystems. Marine ecosystems also act as stabilizers of global systems. We continue to undervalue the marine environment and its contribution to national development, although our marine territory is 24 times our land area.

Trends and Indicators

- Although coastal resources augment tourism earnings, tourism-related activities often have severe environmental impacts, which could reduce Jamaica's ability to sustain its reputation as a tourist destination.
- The 1994 finfish catch was estimated to be about 4.1 million kilograms, a decline from previous years. In contrast, shellfish catch, especially conch and lobster, has increased steadily.
- Commercial fish farming has grown significantly since it began in 1976. By 1990, total land area devoted to aquaculture was over 810 hectares, producing approximately 3.4 million kg. of fish.

Issues

- The physical environment is being altered to provide facilities for tourism and related uses. As a consequence, beach and coastline erosion is accelerating, aggravated also by the mining of sea sand.
- Fish catches are being reduced by increasing numbers of fishermen, poor fishing techniques, in which fine mesh nets trap immature fish, and illegal dynamiting and poisoning.
- Coastal mangroves, wetland areas and seagrass beds which provide breeding, feeding and nursery grounds for fish and shrimp are being destroyed. Harbours and nearshore water bodies are becoming more polluted.

2.11 WILDLIFE AND BIOLOGICAL RESOURCES

Jamaica boasts a rich natural heritage arising from the diverse range of ecosystems created by the country's varied topography, geology, and drainage. These ecosystems include wet and dry forests, rivers, caves, mineral springs, sandy beaches, rocky shores, herbaceous swamps, mangrove swamps, swamp forests, and salinas. This has resulted in an unusually high level of endemism, (organisms being native to a particular location), placing Jamaica fifth in islands of the world in terms of endemic plant species. This rich natural heritage also creates a scenic beauty which, both visitors and locals seek out and enjoy. Natural ecosystems and biological resources contribute to national development through economic inputs (local sales and export of plants, animals, skins, and shells), consumables (fish, meat, etc.), living resources (forest resources, fisheries, etc.), reducing the threat from natural hazards, and maintaining natural processes which support human life.

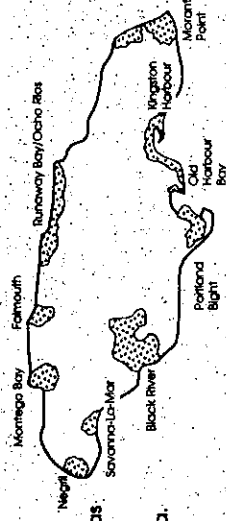
Trends and Indicators

- Some plants and animals have been over-exploited, hence the need for closed seasons or total protection. These species include lobsters, conch, orchids, manatees, Jamaican Parrots, crocodiles, turtles, the Jamaican Iguana, the Yellow Snake, Queen-Conch, corals, Mustached Bats and a large number of birds.
- Wildlife is under serious threat from deforestation, pollution, improperly planned developments, misuse, overuse and illegal export.

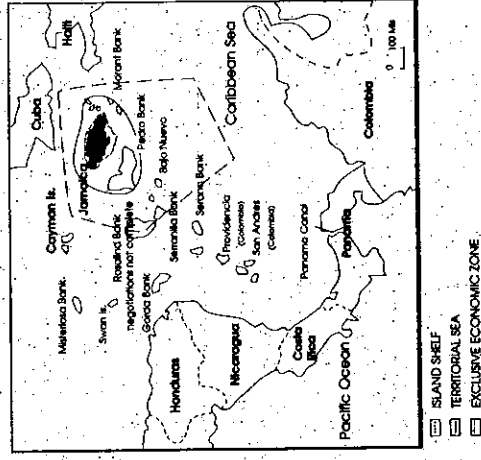
Issues

- Estimates of the rate and extent of destruction of habitats vary, and the basic information is incomplete.
- Degradation of biological resources continues because of inadequate and conflicting policies and legislation, low level of collaboration in international conventions, and the absence of management plans.
- Prospecting is increasing for biological resources, with potential medicinal/economic value, but this needs sustainable management.

Coastal Areas and Wetlands Under Development Pressure



Jamaica's Exclusive Economic Zone - an approximate boundary

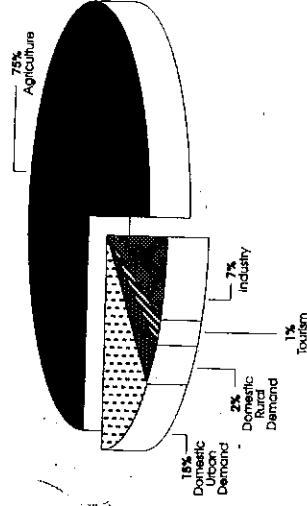


What can we do?

- Farmers can adopt some of the many soil conservation techniques now being promoted.
- We must re-establish the tradition of planting trees at times of celebration, such as births and marriages.
- Beach clean-up is a popular seasonal activity. Adopt a beach and keep it clean throughout the year.
- Don't eat lobster or conch during their closed seasons.
- Become aware of protected plants and animals and become a volunteer game warden.
- Throughout Jamaica, groups of people are identifying natural areas which need some form of protection. Join one of these groups, or take action to start a campaign of protecting an important natural resource or area.

Part 2: Our Natural Resources: where are we now?

Demand for Water



2.12 WATER RESOURCES

Jamaica's freshwater resources come from surface sources (rivers and streams), underground sources (wells and springs), and rainwater harvesting (Community catchments). Reliable safe yields are estimated at 4,084 million cubic metres per year, with ground water accounting for 81%. Approximately 96% of all available groundwater is associated with limestone aquifers, and the remaining 4% with alluvium aquifers.

Trends and Indicators

- Estimated production of water during 1992/93 was 283,366 million litres. Production went up by 7.2% in Kingston and St. Andrew and 3.8% in other parishes.
- Approximately 60% of the water produced is unaccounted for by NWC, that is, lost through illegal connections, leaks, or incorrect billing.
- During 1994 approximately 86% of the population had access to NWC treated water, 9.5% received untreated water, while 4.5% were not served.
- The national average for sewage generation is estimated at 455 million litres/day. Of this, about 25% is collected and treated in conventional treatment systems and the remainder is disposed of using pit latrines, soak-aways, and septic tanks. About 51% of the Jamaican population still use pit latrines.

Issues

- Deforestation, poor land use and construction practices in the watersheds have changed the flows of rivers, and accelerated soil erosion, causing siltation of reservoirs and damage to water treatment works.
- Collecting, treating and distributing water on a reliable basis to the widely dispersed population results in high water costs.
- Sewage effluent and industrial waste are contaminating aquifers at an increasing rate.
- Research is needed on effective alternative forms of sanitation.

2.13 AIR AND WATER QUALITY

Air quality has been affected by increased emissions from industrial sources, vehicular traffic, and open burning of household and commercial wastes. The major industries contributing to air emissions include oil refining, bauxite-alumina processing, mining and quarrying, cement manufacturing, sugar processing and power plants. Ground water becomes polluted by infiltration from sewage, saline intrusion and the leakage of caustic residues from the older red mud disposal sites. In Kingston and St. Andrew, aquifers have been extensively contaminated by sewage, while saline intrusion on the south coast results primarily from over-abstraction of ground water. Pollution of surface waters is much more significant, with many more pollutants contributing to the problem.

Trends and Indicators

- Mean Total Suspended Particulates (TSP) are below the World Health Organisation (WHO) air quality standard of 60 microgram per cubic meter, ranging from 1 microgram per cubic meter at Frame, Westmoreland to 260 micrograms per cubic meter in Montego Bay.
- The mean concentration of lead in Kingston and Montego Bay is 0.5-1 microgram per cubic meter, the limit set by the WHO; indicating that in many parts of each city the concentration is higher.
- Air pollution in Kingston continues to create major health problems with the local population.

Issues

- Interior and coastal waters are being adversely affected by the discharge of sewage, industrial effluents, solid wastes, and agricultural runoff.
- Jamaica lacks routine air quality, heavy metal and hazardous material monitoring programmes.
- Present emission standards are not related to ambient air quality, nor are they specific to regions or industries.
- There is inadequate regulation and control of pollution from motor vehicles and other non-point sources.



Negri's famous seven mile long beach nearly thirty years ago.

Photo courtesy of Jampres LTD.

2.14 WASTE MANAGEMENT

Solid, liquid, and hazardous wastes pose serious environmental problems and risks, including increasing pollution of groundwater, rivers, the marine environment, and the atmosphere. They create unsightly areas, and contribute to breeding of pests, and other noxious conditions. Human health may be threatened directly through poisoning, respiratory problems, and even birth defects.

Trends and Indicators

- Jamaica generates over 10,000 metric tonnes of solid waste per week.
- 80% of household solid waste which is collected is collected by five Parks and Markets Companies. The remaining 20% is collected privately and often dumped in open areas.
- Final disposal consists of open dumping and burning. The 26 officially recognized disposal sites are all impacting negatively on the soil and air in the immediate vicinity and areas farther away. Water pollution is also possible.
- Jamaica imports an estimated 298,700 metric tonnes of hazardous chemicals annually, mainly for the agricultural and industrial processing sectors

Issues

- Lack of a comprehensive waste management policy and clear responsibilities delays implementation of appropriate waste management.
- The physical characteristics of areas receive insufficient attention when planning for disposal sites. Site selection criteria already developed are not rigidly enforced.
- There is no national hazardous waste facility, resulting in such waste often ending up at dump sites with other solid waste materials.
- The Ministry of Local Government and Works is now executing a Solid Waste Management Project which will address these problems.

2.15 NATURAL DISASTERS AND ENVIRONMENTAL ACCIDENTS

Jamaica is susceptible to natural hazards, due to its physiography, geological history, and geographical location. These include earthquakes, hurricanes, tropical storms, flooding, and landslides, which usually result in loss and damage to human life, crops, ecosystems, and property. Some hazards are man-made; including oil and chemical spills, and fires. While natural disasters cannot be controlled, man's use of the environment can reduce or increase the level of impact experienced. As such, land-use planning must incorporate accurate information on areas of high risk, and activities and management practices in these areas have to be carefully designed and implemented.

Trends and Indicators

- The major fault systems in Jamaica, active since the last 10 million years, are the Duanyale, Spur Tree, Rio Minho-Crawle River, South Coast, Wagwater, Jacks Hill, and Blue Mountain-Plantain Garden fault systems.
- Earthquakes of Modified Mercalli (MM) intensity VI and over are the most damaging. Intensity VII earthquakes are expected in Kingston on average every 38 years. The latest, on January 13, 1993, was of magnitude VII and resulted in extensive damage.
- The rate of damaging earthquakes ranges from more than 20 per century in Kingston & St. Andrew to less than 5 per century on the western end of the island.
- There is a 27% probability of a hurricane affecting Jamaica in any given year. Hurricane frequency is not uniformly distributed. Jamaica was impacted by nine hurricanes during each of the decades 1910-1919 and 1930-1939.

- Direct damage from Hurricane Gilbert stood at US\$956 million. Roughly 50% of beaches were seriously eroded, 50% of mangrove trees were lost, 50% of the oyster resources were unsalvageable, marine water quality deteriorated, and landslides were widespread.
- Seasonal rainfall also results in flooding and landslides. The 1991 and 1993 events established respective records in flood levels and duration/intensity.

Issues

- Expanding urbanization of reclaimed land in the narrow coastal fringe and on steep slopes increases risks from natural disasters and requires large-scale hazard mapping and improved site selection.
- Excessive soil loss raises the levels of stream beds, contributing to flooding.
- Natural and man-made disasters have indirect damages and costs, though they are not usually quantified.



The aftermath of Hurricane Gilbert in Kingston, 1988.

Photo courtesy of Jampress LTD.



What can we do?

- Conserve water by fixing leaking pipes, using low volume shower fixtures and low flush toilets.
- If you are not connected to a sewer system, use new technology such as dry toilets to protect groundwater.
- Sinkholes are often used to dump garbage. Keep them clean.
- Help reduce air pollution by tuning your car regularly, and stop burning garbage.
- Reduce garbage by not buying products with unnecessary packaging, reuse things whenever possible, and recycle glass bottles and newspaper.
- Start a compost pile in your yard. Most of our garbage is organic, meaning that it can easily be composted and returned to yards, gardens and fields.

PART 3

Taking Action: Individuals and Organizations

THE IMPORTANCE OF INDIVIDUAL INITIATIVE

People have taken action to protect the environment in a number of ways: engaging in advocacy and militant action against pollution, carrying out research and training, and becoming involved in community development planning efforts. Such initiatives have served to halt destructive action either directly, or through the invocation of community, national, or international action. In recognition and support of individual initiative, this *State of the Environment Report* highlights the contribution of the people who have pioneered actions to protect Jamaica's environment and promote sustainable use of our natural resources.

• Harold Cahusac

Mr. Cahusac was one of the first advocates for protection of Jamaica's watersheds. He became the first Chairman of the Watershed Protection Commission after its formation in 1963. He was responsible for a major reforestation programme in Westmoreland. A sugar-cane planter, he served in various local and national capacities, including chairman of the National Water Authority.

• Thomas & Nora Goreau

Thomas Goreau is credited with the establishment of the aqualung as a marine biological research tool. Beginning in 1951 as a lecturer at the University of the West Indies Medical School, he used home-made equipment in his dives to photograph coral reef species and conditions in Jamaica. He and Dr. Nora Goreau continued their pioneering research in coral reef ecology over the following 20 years, making Jamaican reefs some of the best and longest studied in the world. During this time, the two marine biologists also founded the marine laboratories at Port Royal and Discovery Bay. The Goreaus prepared proposals for establishing marine parks in Montego Bay and Ocho Rios.



Lisa Salmon caring for an injured doctor bird at her Rocklands Feeding Station.

(Photo courtesy of The Gleaner)

• Lisa Salmon

A founding member of the Goose Bird Club, Lisa Salmon is widely known for establishing the Rocklands Bird Sanctuary in St. James. Her work as an advocate for bird protection started in 1952 when she began writing articles against the practice of bird shooting. In 1959, mainly as a consequence of her writings, the bird shooting season was reduced from six months to six weeks. She started the bird sanctuary in 1959, with funding from the British Air Force. Since then, she has worked to build the sanctuary, to support local forestry conservation and environmental education activities, and to develop an attraction for visitors and locals alike.

• Jacob Taylor

Mr. Taylor entered the Civil Service in 1938, and joined the Beach Control Authority as its assistant secretary and accountant in 1956. He became secretary to the Authority in 1963. Since then, he has given unbroken service in the development of Jamaica's coastal lands, becoming a director in the Natural Resources Conservation Department when that agency assumed responsibility for the Beach Control Authority in 1975, and later as a consultant to the Natural Resources Conservation Authority. Mr. Taylor was awarded the honour of Officer of the Order of Distinction (O.D.) in 1977.

GROUP AND COMMUNITY ACTION

Jamaica, like countries all over the world, has seen the emergence of a growing and strong community NGO movement to resolve local problems. Some groups have a main focus on the environment, others on development. All share in the establishment of a social partnership in support of sustainable development. A few of these NGOs are highlighted here.

• Bluefields People's Community Association (BPCA)

The Association consists of 7,000 residents of five communities in Westmoreland. Established in 1989, its objective is community

development, achieved through linking the environment and economic sustainability. BPCA develops its activities under four programme areas: small business, agriculture and fisheries, education, and institutional strengthening. To date, the organisation has

established a resource and training center and has carried out a number of development activities, including training for 20 local farmers in management of permanent crops, establishing a tools bank for members, training 30 single mothers in dressmaking, providing a child care course for parents and teachers, and establishing a horticulture nursery and environmental education center.

- **National Environmental Societies Trust (NEST)**

NEST was formed in 1989 as an umbrella organization for NGOs in Jamaica. This mission is being achieved by coordinating NGO efforts related to the environment, providing a forum to deliberate environmental issues, providing a central lobby to influence Government decision making on environment and development and liaising with Government to ensure participation of NGOs in the development process. A central focus is building capacity in NGOs, primarily through training and providing a communication network and central secretariat for NGOs.

- **Portland Environmental Protection Association (PEPA)**

PEPA was founded in 1988. Its objective is the preservation of the environment. PEPA works through the voluntary contribution of its 41 civic and citizens groups to protect the natural resources of Portland, and to promote sustainable development. PEPA is both an advocacy and an implementing organization. It has undertaken numerous activities, including water quality monitoring, conducting environmental awareness forums, monitoring bird shooting activities, and participating in developmental activities. PEPA is also well known for the establishment of 14 PEP clubs in schools throughout Portland.

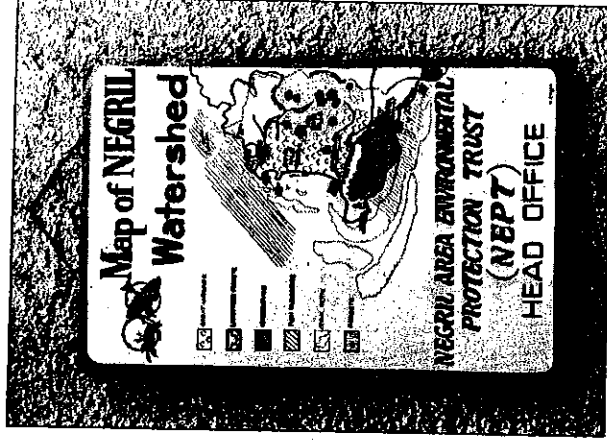
- **South Coast Conservation Foundation (SCCF)**

This group began in 1992, and is dedicated to the effective management and sustainable use of the natural resources of the Portland Bight/Hellshire Hills area. The SCCF aims to have delegated management responsibility for the area, and has developed a comprehensive programme to address the question of sustainable management of the Portland Bight ecosystem. The programme is intended to: establish a benchmark against which to judge management effectiveness; identify resource users; recommend legislative and policy changes for effective

management of the area; strengthen community groups; establish partnerships between the government and community groups; and provide a forum for community empowerment. The SCCF aims to achieve these objectives through projects presently underway, including biosphere baseline surveys, organization of resource user groups, community education, and review of environmental legislation.

- **Kiwanis Club of North St. Andrew**

The North St. Andrew chapter, chartered in 1974, carries out a wide variety of community services, aimed primarily at young people and the less fortunate. Their programmes also include a number of environmental activities, such as tree planting at schools in St. Andrew, site clean-up and maintenance at Kinyre and Scouts Headquarters, pesticide abuse education and training, building of sanitary conveniences in the Riverton City Community, and training boys in places of safety in general hygiene and animal care.



Negri watershed map adorns sign in front of offices to Negri Area Environmental Protection Trust.

ORGANIZATIONS ACTIVE IN THE ENVIRONMENT*

- Association of Development Agencies (ADA)
 - Blue Cross Health & Environment Foundation
 - Gasse Bird Club
 - Jamaica Alternate Tourism, Camping & Hiking Association
 - Jamaica Conservation & Development Trust (JCDDT)
 - Jamaica Environment Trust (JET)
 - National Environmental Societies Trust (NEST)
 - National Wildlife Foundation
 - Natural History Society of Jamaica
 - Private Sector Organization of Jamaica (PSOJ)
 - Social Development Commission (SDC)
 - The Jamaican Geographical Society
 - The Geological Society of Jamaica
 - Wildlife & Environment Conservation Action Now (WECAN)
 - **Kingston & St. Andrew**
 - Community Environmental Resource Center (CERC)
 - Enity
 - Friends of Jamaica Environment Committee
 - Future Vision Foundation
 - Guiding Light Foundation
 - Holywell Conservation Foundation
 - ICWI Foundation
 - Association of Development Agencies (ADA)
 - Jamaica Environment Youth Watch
 - National Arboretum Foundation
 - Projects for the People
 - Rockfort Warlike-East Kingston Environmental Trust
 - South Coast Conservation Foundation (SCCF)
 - **St. Catherine**
 - Portmore Environmental Protection Trust
 - **Clarendon**
 - Aeon Town Local Disaster Preparedness Committee
 - South East Clarendon Development Foundation
 - **Manchester**
 - Central & South Tourism Organization (CESTO)
 - Jamaica Junior Naturalists (JJN)
 - **St. Elizabeth**
 - Black River Environmental Protection Association (BREPA)
 - Malvern Science Resource Center
 - **Westmoreland & Hanover**
 - Bluefields Peoples' Community Association
 - Negri Chamber of Commerce
 - Negri Coral Reef Preservation Society
 - Negri Environmental Protection Trust (NEPT)
 - **St. James**
 - Environmental Watch Organization
 - South St. James Social & Economic Development Trust
 - St. James Environmental Protection Trust (STEPT)
 - **Trelawny**
 - Trelawny Environmental Protection Association (TEPA)
 - **St. Ann**
 - Friends of the Sea
 - St. Ann Environmental Protection Association
 - **St. Mary**
 - St. Mary Association for Recovering Tomorrow
 - St. Mary Environmental Protection Committee
 - **Portland**
 - Portland Environmental Protection Association (PEPA)
 - **St. Thomas**
 - St. Thomas Environmental Protection Association
 - Yallahs Community Development Fund Limited
- (This is not an exhaustive listing. If your organization is active in the environment but is not listed, let the NECA know so that it can be included in the next SOE report.)*

Part 3: Taking Action: Individuals and Organisations



Current NRCA Board Chairman Ms. E. Nadine Isaac with the Minister of the Environment and Housing, Easton Douglas. The NRCA is administered by a ten member Board, appointed by the Minister. This Board is supported by an Executive Director and a team of over 100 professional, technical, clerical and auxiliary staff.

NRCA: ITS HISTORY AND MISSION

The Natural Resources Conservation Department (NRCD) was established in 1975 when Jamaica, on returning from the first United Nations Conference on the Environment (Stockholm 1972), attempted to address the need for an umbrella environmental management agency. The NRCD was formed by merging a number of Commissions existing at the time; namely the Watershed Protection Commission, the Wildlife Protection Committee, the Beach Control Authority, the Natural Resources Planning Unit, the Marine Advisory Committee, and the Kingston Harbour Quality Monitoring Committee. In addition to the responsibilities contained within the three related Acts, the NRCD was mandated by Parliament to protect general environmental quality, and as such was organized and given additional technical capability in the areas of aquatic resources management (water quality, wetlands, and oceanography) and wildlife management.

The NRCD, while attempting to manage Jamaica's environment effectively, was limited by the absence of certain fundamental powers, thereby making it essentially an advisory body. This need for more legislative authority, as well as the need for a more comprehensive environmental management framework, led to the NRCD being transformed into the NRCA in 1991. The expanded authority of the NRCA include the power to request environmental impact assessments for projects, licence discharges of trade effluent to the environment, require performance evaluation of pollution control facilities, and declare and manage national parks and other protected areas. Additionally, the NRCA Act supercedes all other legislation in matters concerning management of natural resources and general environmental quality. The NRCA's functions can best be understood by reviewing the mission statements of the programme divisions within it.

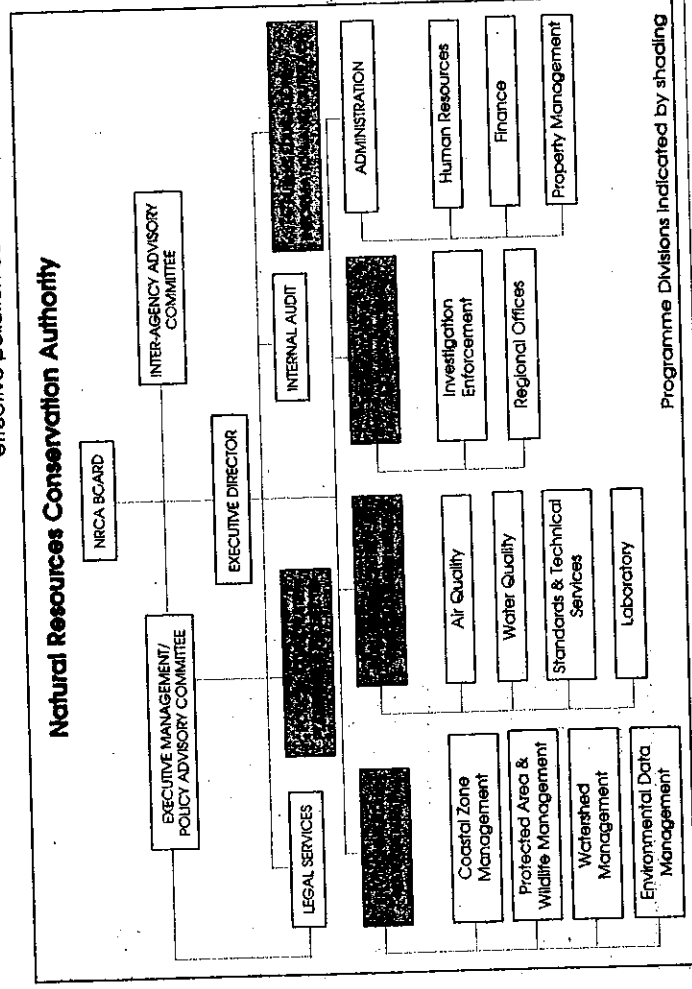
- **Pollution Control and Waste Management Division**

The goal of this Division is to maintain an effective pollution control and waste

management programme to protect human health and the environment. This goal is to be achieved through establishing environmental standards, and ensuring compliance with these standards. This often requires collaboration with a number of government and private sector organizations.

- **The Laboratory Services Unit**

The Laboratory aims to support the pollution control programme of the NRCA, to improve air quality monitoring, and to encourage and support water quality monitoring among government and non-government organizations.



- **Environmental Management Division**

The Environmental Management Division integrates the NRCA's natural resource planning and management functions. Within it, the Environmental Data Management Branch is the information and data clearinghouse, linked to other government and non-government information systems. It supports the work of the other three branches described below.

- **Coastal Zone Management Branch**

The Coastal Zone Management Branch's mission is to protect Jamaica's coastal and related marine systems. It aims to achieve this through developing a policy and regulatory framework for coastal zone management, participatory approaches to management of coastal resources, and through training of user groups and individuals.

- **Watershed Protection Branch**

The Watershed Protection Branch is responsible for protecting Jamaica's watersheds, and ensuring that they are used in an environmentally sound manner. It pursues this mandate by developing watershed management policies, monitoring and enforcement, forging partnerships for project implementation and management, and public education.

- **National Parks, Protected Areas and Wildlife Branch**

This Branch's role is to protect the diversity of living creatures and plants for sustainable use. This will be achieved primarily through formulating policies and strategies to guide the development and management of protected areas, and general conservation of wildlife.

- **Public Education, Information and Outreach Division**

The goal of this division is to increase the levels of public knowledge and awareness of the need to conserve and protect Jamaica's natural resources. The Branch achieves this goal through integrating environmental awareness programmes into the technical programmes of the NRCA, promoting a coordinated approach to environmental education among the public and private sectors, and undertaking awareness programmes aimed at the general public.

- **Regulatory and Compliance Division**

The Regulation and Compliance Division seeks to encourage voluntary compliance with the NRCA Act, and is required to enforce the provisions of the Act where violations occur.

- **Policy, Corporate Planning and Projects Division**

This aims to improve the institutional capacity of the NRCA through strengthening the leadership of the organization, maximizing the effectiveness of donor funding, facilitating information flows within the organization, and ensuring the progress of projects.

Environmental Policy

The environmental policy of Jamaica is embodied in a statement of objectives enunciated in the Jamaica National Environmental Action Plan of 1995. These objectives include:

- Creating attitudes and behaviour which are responsible and oriented to action in environmental protection and the sustainable use of natural resources.
 - Encouraging the use of non-renewable resources including bauxite, limestone and other minerals for the greatest social and economic benefit of the Jamaican people while minimizing harmful environmental impacts.
 - Ensuring that renewable resources including forests and wildlife are used in a sustainable manner.
 - Ensuring good air quality in Jamaica
 - Ensuring that surface and underground water are in sufficient quantities and quality appropriate for present and future human needs and ecosystem integrity.
 - Allowing for global environmental co-operation and security with special attention to the needs of developing countries and the circumstances of vulnerable island states.
 - Enhancing the natural beauty of the island in natural and built-up areas, roadways, and open spaces on both public and private land.
 - Protecting and preserving the marine environment and territorial waters within the exclusive economic zone.
 - Promoting research and development of appropriate technology which is environmentally friendly.
 - Promoting socio-economic and technical research as it relates to the development and use of the natural resources and the environment.
 - Promoting the reduction of inefficiency and waste as a method of yielding additional financial resources for environmental management.
 - Developing renewable energy sources while seeking to reduce the use of fossil fuels.
- The JANEAP Status Report (1996) adds the following new sectors for national action:
- Sustainable Development
 - Green Consumerism/Purchasing and the Greening of Industry
 - The Greening of Government
 - System of Environmental and Economic Accounting
 - Sustainable Environmental Tourism
 - Environmental Health

ACTIVITIES OF OTHER GOVERNMENT AGENCIES

Almost every developmental activity in one way or another affects the natural environment. Thus, Jamaica, like many other countries, has a number of institutions which are responsible for managing various aspects of the environment. All these agencies need to work together in a coordinated effort. The Inter-agency Technical Advisory Committee on the Environment has over 40 representatives, illustrating the challenges of collaboration and coordination. The following are several of the key government agencies with which the NRCA collaborates in the protection of the Jamaican environment.

Interagency Environmental Standards Technical Committee Representation

- National Water Commission
- Ministry of Agriculture
- Factory Inspectorate Division, Ministry of Labour
- Petrojam Limited
- Meteorological Office
- Bureau of Standards
- Jamaica Manufacturers Association
- Environmental Control Division
- Jamaica Public Service Company
- Water Resources Authority
- Centre for Nuclear Sciences
- Transport Authority
- Jamaica Bauxite Institute
- Scientific Research Council
- Natural Resources Conservation Authority

• Environmental Control Division (Ministry of Health)

The ECD is responsible for developing policies, criteria, and guidelines for the control of air and water pollution, abatement of environmental health hazards, and control of aspects of occupational health. The ECD enforces its mandate through the Public Health Act, 1974. As a development review body, the ECD uses a systematic appraisal method to approve all engineering plans and specifications for water and waste-water treatment and disposal facilities for subdivisions and development projects.

• Town Planning Department (TPD)/Town & Country Planning Authority

The Town and Country Planning Authority is the main planning agency regulating land use in Jamaica. It is responsible for preparing national, regional, urban, and local plans, and development orders. The Town Planning Department is the implementing arm of the Authority. In addition to plan preparation, the TPD advises the local authorities on applications for subdivisions, change of use, and building activities. The TPD also provides advice to the public, developers, and other government agencies on matters relating to the use of land.

• Fisheries Division

This body is responsible for the management of Jamaican fisheries. Its programmes are geared towards promoting the use of fisheries resources (including aquaculture) in a manner which will provide economic benefits to the people in the industry and the country in general.

• Forest and Soil Conservation Department

This is the main agency responsible for the management of forestry resources. It carries out its mandate through developing and implementing a number of programme areas. These include forest development and

management, watershed management, soil conservation, forest recreation development, and forest research and extension.

• Water Resources Authority

This is the primary agency responsible for regulating ground water extraction. The UWA gathers data on stream flow, surface water quality, and other hydrologic features. The agency advises developers and other government agencies on matters related to water supply and protection. The UWA also has the primary responsibility for ground water quality assessment and risk mapping, and plays a key role in flood-plain mapping and hazards determination and management.

• Jamaica National Heritage Trust

This statutory body falls within the Ministry of Youth and Culture. Its main function is to identify and preserve Jamaica's heritage resources, including physical structures and objects, underground, above ground and beneath the sea. These include buildings, churches, statues, cemeteries, clock towers, bridges, caves and other landmarks, artifacts, and archaeologically important sites (such as sunken cities and Arawak Indian sites). The JNHT is also responsible for declaring national monuments.

• Planning Institute of Jamaica

The PIOJ was set up to strengthen the planning capability of the Government of Jamaica. It facilitates and coordinates planning for the economic, financial, social, cultural, and physical development of Jamaica. In addition to collecting, analyzing, and reporting on economic performance data, the PIOJ advises the Government on major issues related to economic and social policy. The agency is also responsible for representing the Government in negotiations with bilateral and multi-lateral organizations such as the IMF, and for managing technical cooperation agreements and programmes with these organizations.



Community beach clean-up at Rose Town fishing beach as part of International Coastal Clean-up Day in 1995.

Photo courtesy of Jampress LTD.

LOCAL GOVERNMENT/LOCAL AUTHORITIES

Local government's involvement in environmental management takes place primarily through the operations of the Parish Councils. Parish Councils have two broad areas that carry with them environmental responsibilities. They function as the local health boards and as the local planning authorities. The Ministry of Local Government acts mainly to set policy, provide funding, and monitor activities, and becomes involved in implementation only where policy changes are required. Environmentally related programmes of the Parish Councils include public cleansing and management of dump sites, land use planning and development control, maintaining public bathing beaches and monitoring bathing water quality, protection of watershed areas around local water supply sources, and assisting central government agencies in general environmental monitoring.

FUNDING ASSISTANCE FOR ENVIRONMENTAL ACTION

Resources to support environmental action take the form of people, community groups, businesses, and funding institutions. At one end of the spectrum, people give of their time and use their personal equipment to support particular activities. Financial support is given as cash, equipment and materials, prizes in fund raising efforts, and discounts on purchases of goods and services. A number of local and international financial institutions also fund projects on a regular basis.

• Environmental Foundation of Jamaica

This organization was created in 1991 under the Enterprise for Americas Initiative Debt Reduction Agreement between the Governments of Jamaica and the United States of America. The mandate of the EFJ is "the promotion and implementation of activities designed to conserve and manage the natural resources and environment of Jamaica, in the interest of sustainable development". The EFJ achieves this mission primarily through providing funds to NGOs and community organizations for implementing strategic environmental initiatives. Since the EFJ began operating two years ago, it has approved 74 projects, with a value of J\$42.39 million.

• CIDA Green Fund

The Green Fund was set up in 1993 by the Canadian International Development Agency. The objective of the Fund is to contribute to the process of sustainable development of Jamaica, through the provision of support to community-based initiatives in the management of Jamaica's natural resources. In its two years of operation, the Green Fund has approved 56 projects, with a value of J\$16.07 million.

Other Institutions Involved in Environmental Management

- Jamaica Bauxite Institute
- Jamaica Coast Guard
- Marine Police
- Mines and Quarries Division
- National Water Commission
- Office of Disaster Preparedness and Emergency Management
- Port Authority of Jamaica
- Rural Agricultural Development Authority
- Rural Physical Planning Unit
- Tourism Action Plan
- Urban Development Corporation
- Petroleum Corporation of Jamaica
- Jamaica Tourist Board
- Coffee Industry Board
- Sugar Industry Authority
- Consumer Affairs Commission.

PARTICIPATION AND ASSISTANCE FROM THE INTERNATIONAL DONOR COMMUNITY

Assistance to the NRCA during the 1994/95 year included the following projects:

1. USAID - Development of Environmental Management Organizations (DEMO).
2. IDB - Institutional Strengthening Project.
3. CIDA - Environmental Assistance (ENACT) Programme.
4. OAS - Multinational Project on the Environment.
5. Jamaica/Sweden Cooperation - Comprehensive Coastal Zone Planning Project.

The institutions listed above, along with other donor organizations, assisted a wide range of government and non-government organizations with the development and implementation of environmental projects. Areas of focus included the following:

1. Institutional Strengthening. (USAID, CIDA, UNDP, IDB, UNEP)
2. Sewerage/Solid Waste Management (USAID, IDB, OECF, European Union)
3. Watershed/Forestry/Agro-forestry/Hillside Agriculture/Fisheries (USAID, CIDA, UNDP, FAO, OECF, CARICOM Secretariat, Netherlands Government, European Union)

4. Development Planning (UNDP, IDB)
5. Community Development/Community Resource Management (OAS, CIDA)
6. Environmental Monitoring/ Research/ Information Systems (CIDA, FAO, IDB)
7. Storm Water Drainage/Flood Control (UNDP, OECF)
8. Typhoid Control and Prevention (USAID)
9. Environmental Policy/Regulations (USAID)
10. National Parks and Protected Areas (USAID, European Union)
11. Shelter/Urban Infrastructure (USAID, UNDP, OECF)
12. Public Education/Awareness (All institutions)

Other international organizations outside the main donor community have assisted Jamaica in its environmental work. These have included regional and international non-governmental organizations and private institutions.

PART 4 NRCAs Environmental Strategy for 1996

The NRCA is responsible for providing the broad policy framework to guide the actions of many organizations working in environmental management. In developing this framework, and to implement the subsequent programmes, the Agency needs to collaborate with several government agencies which have major environmental responsibilities. Most importantly, environmental management and the goal of sustainable development are not the responsibility of the government alone. Individuals and other groups will be required to participate.

The general strategy is to continue preparation of regulations and prepare policy statements (green papers on beach access, and environmental policy); develop mechanisms for coordination of effort among the various agencies and community groups; prepare management plans for protected areas and protection of endangered species of wildlife; encourage best care practices, voluntary compliance and self monitoring by industry through incentive schemes and increased verification monitoring; develop mechanisms based on the "Polluter Pays" and "User Pays" principles to discourage pollution and waste of resources; develop improved mechanisms for enforcement of environmental laws; and carry out a sustained programme to create environmental literacy.

A significant development priority in 1996 will be the implementation of the Permit and Licensing System under the NRCA Act. Other priorities are shown below.



Peter Espeut (left) of the South Coast Conservation Foundation and NRCA Executive Director Franklin McDonald looking over a copy of the Parks and Protected Area System Green Paper before one of the community forums.

Photo courtesy of Jampress LTD.

Coastal Zone Management

- Develop and implement a Comprehensive Integrated Coastal Zone Management Plan by 1998.
- Complete a coastal inventory including a survey of beach encroachment; and establish a coastal zone monitoring programme.
- Establish and enforce regulations related to coral reefs, mangroves and coastal wetlands protection, marine development, beach access and mariculture.
- Implement a public beach rehabilitation programme, incorporating local co-management. Six beaches are targeted under this programme for 1996.
- Complete the development of the national Coral Reef Initiative Programme.

fuelwood and yam-stick plantations) and agro-forestry on hillside in selected watersheds.

Protected Areas and Wildlife

- Finalise and implement policy on The System of National Parks and Protected Areas for Jamaica.
- Declare protected areas in Negill, Black River, Yallahs, Port Antonio, Cockpit Country, the Palisades and Port Royal Cays.
- Prepare species management plans for endangered and threatened species including crocodile and Sooty Tern (Booby).
- Implement manatee and Iguana management plans, and sea turtle action plan.
- Accede to and ratify relevant international wildlife/habitat conventions.
- Complete the delegation of management authority to NGOs for co-management of parks and protected areas for the Blue Mountain and John Crow Mountains National Park and the Montego Bay Marine Park.
- Enact regulations governing the import/export and harvesting of selected wildlife species.
- Conduct population and status surveys for the species subject to hunting such as pigeons and doves.
- Prepare and implement management plans for endangered species (manatee, booby or sooty tern, crocodile, sea turtles, Iguana, Jamaican parrots, etc.).

Watershed Protection and Management

- Re-establish an effective national inter-agency watershed management committee and appropriate local watershed management arrangements.
- Establish four watershed management areas with local participation with programmes for their protection and rehabilitation.
- Update watershed legislation and develop regulations. Prepare specific guidelines for developments in selected watersheds.
- Demonstrate practical approaches to watershed preservation (such as encouraging

Watershed Management Units



- | | | | |
|----|-----------------------------|----|-----------------------|
| 1 | South Negill - Orange River | 14 | Drivers River |
| 2 | Lucas River | 15 | Plantain Garden River |
| 3 | Great River | 16 | Morant River |
| 4 | Montego River | 17 | Yallahs River |
| 5 | Martha Brae | 18 | Hope River |
| 6 | Rio Bueno - White River | 19 | Rio Cobre |
| 7 | Rio Nuevo | 20 | Rio Minho |
| 8 | Oracabessa - Pojee River | 21 | Milk River |
| 9 | Wag Water River | 22 | Gut - Alligator Hole |
| 10 | Pinar - Buff Bay River | 23 | Black River |
| 11 | Spanish River | 24 | Dean Valley River |
| 12 | Swift River | 25 | Cabarita River |
| 13 | Rio Grande | 26 | New Savannah River |

Regulation and Compliance

- Establish an Environmental Enforcement System incorporating full time and voluntary staff and train in procedures for enforcing legislation relating to the environment.
- Develop a capacity for cross-empowerment of all government agencies (such as forest and park rangers, game and conservation wardens, building and public health inspectors, inspectors of mines, etc.).
- Develop and implement regulations for beach access, mangrove protection, mariculture, marina development, wildlife import/export and harvest, effluent discharge and air emissions.
- Initiate environmental awareness training programs for the Police and Judiciary.

Environmental Literacy, Education and Information

- Strengthen the national framework for environmental information dissemination through the National Environmental Documentation Centre at NRCA, regional resource centres, NGO collections, schools, and the Jamaica Library Service.
- Develop and implement public education and information programmes in collaboration with NEST and NGOs.
- Prepare a series of environmental information brochures, posters and audio visual material.

- Expand the work of The National Environmental Committee, particularly in relation to curriculum infusion into the formal education system.
- Publicize pollution control procedures, effluent and emission standards and the environmental impact assessment process.
- Direct the observance of Earth Day, National Environmental Awareness Week and similar special events.

Pollution Control and Waste Management

- Reduce industrial pollution by implementing the mandatory permit and licensing system for effluent discharge and air emissions. Environmental Assessments will be required for certain developments as of August 1, 1996.
- Establish a national programme of air quality monitoring.
- Develop a comprehensive national policy, and related regulations, on waste management.
- Initiate action to select a site for hazardous waste disposal.
- Develop the incentive scheme for compliance with environmental standards as required by the National Industrial Policy.
- Achieve accreditation of the NRCA Laboratory.

ACKNOWLEDGEMENTS

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- Environmental Control Division, Ministry of Health
- Fisheries Division
- Forest Department/Forestry and Soil Conservation Division
- Institute of Jamaica, Natural History Division, Geology Division
- Jamaica Agriculture Society
- Jamaica Bauxite Institute
- Jamaica Hotel and Tourist Association
- Jamaica National Heritage Trust
- Jamaica Public Service Company
- Jamaica Tourist Board
- Metropolitan Parks and Markets
- Mines and Quarries Division
- Ministry of Agriculture
- Ministry of the Environment and Housing
- Ministry of Public Utilities, Transport & Energy
- Ministry of Tourism
- National Housing Trust
- National Water Commission
- Office of Disaster Preparedness
- Petroleum Corporation of Jamaica
- Planning Institute of Jamaica
- Rural Agriculture Development Agency
- Statistical Institute of Jamaica
- Tourism Action Plan
- Water Resources Authority
- University of the West Indies Marine Sciences Unit, Geology Department
- Assistance was also provided by the GOJ-USAIID financed DEMO project through Technical Support Services, Inc.

Five Ways that you can be part of the next State of the Environment Report.

- 1 Write or call the NRCA to tell us how we can make next year's Report more useful to you. (Deadline, December, 31, 1996)
- 2 Write or call the NRCA to recommend what environmental issues or problems should be considered as priorities during 1997-98. (Deadline: December 31, 1996)
- 3 Tell us about individuals and organizations that are taking action and making a difference regarding protection and sustainable use of our land, air, and water. We want to recognize those who played an important role in Jamaica's past, as well as those who are active today. (Deadline: January 31, 1997)
- 4 Contribute photographs to be used in next year's Report. The theme will be "land of wood and water". We invite amateur and professional photographers to submit black and white or color prints or slides which in some way capture the beauty and sustainable use of the country's forest and water resources. These will be part of a traveling display, and selected photographs will appear in next year's *State of the Environment Report*. (Deadline: January 31, 1997)
- 5 For schools, make posters which explore the theme "land of wood and water", capturing the beauty and sustainable use of Jamaica's forest and water resources. Each school can submit two posters. They will be included with the traveling photo exhibit described above, and some will appear in next year's *State of the Environment Report*. (Deadline: January 31, 1997)

Send comments, suggestions, photographs, and posters to the following address. For more information please contact by mail or phone the:

State of the Environment Report
Public Education, Information, and Outreach Division
Natural Resources Conservation Authority
53 1/2 Mofynes Road
Kingston 10
Jamaica, W.I.
Phone: 923-8128; 923-5185

Key Documents Related to Jamaica's Environment

UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT RIO DE JANEIRO, JUNE 1992

This UNCED conference resulted in several major achievements:

- Agenda 21 - a comprehensive blueprint for the global actions required for the transition to sustainable development;
- the Rio Declaration on Environment and Development - principles defining the rights and responsibilities of States;
- a set of principles to support the sustainable management of forests worldwide; and
- two legally binding conventions aiming to prevent global climate change and the eradication of biologically diverse species and erosion of natural biological diversity.

COUNTRY ENVIRONMENTAL PROFILE

Jamaica's first Country Environmental Profile (CEP) was produced in 1988. A comprehensive examination of environmental conditions, issues and recommendations for action, the document remains an important, although somewhat dated and scarce, information source. A revision is underway and expected to be published by the end of 1996. The NRCA intends to revise this CEP every five years.

JAMAICA NATIONAL ENVIRONMENTAL POLICY (JANEAP)

The Government prepares this every three years, with an annual status report. This documents Jamaica's major environmental problems and formulates the appropriate policy, legal framework, and programmes to address these problems. The JANEAP continues the Government's environmental initiatives, recognising commitments made at the Earth Summit in 1992, the UNCED Small Islands Developing States (SIDS) Conference in April 1994 and all other international agreements.

POLICY PAPERS

From time to time, the Government prepares "Green Papers" to publicize and elicit comments on proposed policies or issues of national importance. Following nationwide discussion and commentary, it is revised and, upon approval by Parliament and Cabinet, released as a "White Paper", stating official government policy. Three Green Papers were published in 1994, relating to industrial, forest, and land policy. One on Parks and Protected Areas was published in 1995. In early 1996, a White Paper on National Industrial Policy was released.

Towards a National System of Parks & Protected Areas

This document identifies the goals for the system, the types of units within it (National Parks, Marine Parks, Nature Preserves, etc.), and the roles and responsibilities for the public and private agencies, institutions, and organizations who will manage the lands and waters within the system. Policies related to planning, financing, management, and operations are outlined, as well as the legal framework necessary. Finally, it lists the nearly 150 sites identified to date to be considered for inclusion into the system.

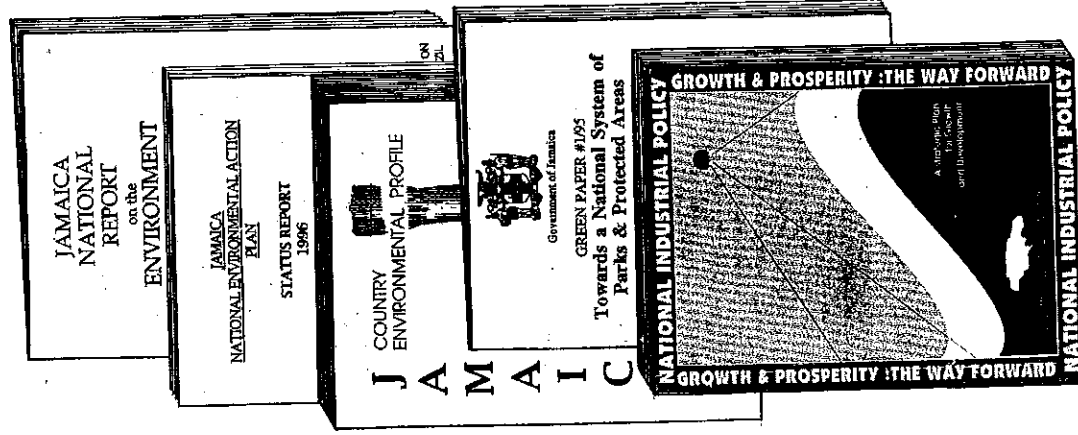
National Industrial Policy, Growth and Prosperity: The Way Forward

This "White Paper" outlines policies related to investment, productivity, and growth in the sectors producing tradable goods and services in the economy. It outlines a strategic plan for all productive sectors (manufacturing, agriculture, tourism/entertainment, mining/chemical, and information/technology) to follow over the next 15 year period. While the emphasis is on the economic activities of production and consumption, and the process of economic growth, it recognizes the need for integration of economic, social, and environmental policy.

During 1996 it is expected that Green Papers on Beach Policy and an overall Environmental Policy will be published.

STATE OF THE ENVIRONMENT REPORT

The Government will prepare this report annually. The NRCA will prepare the draft document early in the year for use in updating of the JANEAP parallel with the annual Government budgeting process. In this way Jamaicans can be informed of progress and new problems in time for their comments to affect deliberations on solutions. The published report will be available during Environmental Awareness Week in early June.



The UNCED documents, Jamaica's report prepared for the Earth Summit, and other documents mentioned here may be consulted in the NRCA Documentation Centre and are also available through regional resource centres and parish libraries.