

JaNEAP

Jamaica's National Environmental Action Plan



2006-2009

Pursuing Sustainable Development – the environmental action agenda



National Environment and Planning Agency

An Agency of the Ministry of Local Government and Environment

Jamaica's National Environmental Action Plan (JaNEAP)

2006 to 2009

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APPENDIX A – List of Participating Agencies/Institutions

APPENDIX B – Reference Documents

LIST OF ACRONYMS

BOD	Biological Oxygen Demand
CBO	Community Based Organization
CDM	Clean Development Mechanism
CESTO	Caribbean Environmental Sustainable Tourism Organization
CFCs	Chlorofluorocarbons
CMS	Centre for Marine Sciences
CPACC	Caribbean Planning and Adaptation to Climate Change
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species (of Wild Fauna and Flora)
CO	Cabinet Office
CPC	Chief Parliamentary Council
CWIP	Coastal Water Quality Improvement Project
EEPI	Environmental Economic Policy Instruments
EEZ	Exclusive Economic Zone
EFJ	Environmental Foundation of Jamaica
EIA	Environmental Impact Assessment
EMS	Environmental Management Systems
ENACT	Environmental Action Programme
ENGO	Environmental Non-Governmental Organization
FAO	Food and Agriculture Organization
FCCC	Framework Convention on Climate Change
FD	Fisheries Division of Ministry of Agriculture and Lands
GEF	Global Environment Facility
GIS	Geographic Information System
GOJ	Government of Jamaica
HACCP	Hazard Assessment and Critical Control Point analysis
ICENS	International Centre for Environmental & Nuclear Sciences
ICRI	International Coral Reef Initiative
IDB	Inter-American Development Bank
IPM	Integrated Pest Management
ISO	International Organization for Standardization
JaNEAP	Jamaica National Environmental Action Plan
JASPEV	Jamaica Social Policy Evaluation
JBI	Jamaica Bauxite Institute
JBS	Jamaica Bureau of Standards
JCDT	Jamaica Conservation Development Trust
JCRAP	Jamaica Coral Reef Action Plan
JNHT	Jamaica National Heritage Trust
JNPTF	Jamaica National Park Trust Fund
JPSCo	Jamaica Public Service Company Limited
JSDNP	Jamaica Sustainable Development Network Programme
KMA	Kingston Metropolitan Area
KMR	Kingston Metropolitan Region
LAMP	Land Administration and Management Project
LDUC	Land Development and Utilization Commission
LIS	Land Information System
LTIS	Land Titling Information System
MARPOL	International Convention on the Protection of Pollution from Ships

MBMP	Montego Bay Marine Park
MEA	Multi-lateral Environmental Agreement
MIND	Management Institute for National Development
MITEC	Ministry of Technology Energy and Commerce
MOH	Ministry of Health
MPM	Metropolitan Parks & Markets
MTSF	Medium Term Socioeconomic Framework
NBSAP	National Biodiversity Strategy & Action Plan
NCST	National Commission on Science and Technology
NCRPS	Negril Coral Reef Preservation Society
NEEAPSD	National Environmental Education Action Plan for Sustainable Development
NEPA	National Environment and Planning Agency
NEEC	National Environmental Education Committee
NEST	National Environmental Societies Trust
NEPT	Negril Environmental Protection Trust
NHDC	National Housing Development Corporation
NFAP	National Forestry Action Plan
NGOs	Non-Governmental Organizations
NLA	National Land Agency
NRCA	Natural Resources Conservation Authority
NSDF	National Sustainable Development Framework
NSWMA	National Solid Waste Management Authority
NWC	National Water Commission
OAS	Organization of American States
ODPEM	Office of Disaster Preparedness and Emergency Management
ODS	Ozone Depleting Substances
Operation PRIDE	Programme for Resettlement and Integrated Development Enterprise
PAHO	Pan America Health Organization
PCJ	Petroleum Corporation of Jamaica
PIOJ	Planning Institute of Jamaica
PM10	Particulate Matters 10 microns
PSOJ	Private Sector Organization of Jamaica
RADA	Rural Agricultural Development Authority
SD	Sustainable Development
SPAW	Specially Protected Areas and Wildlife
STATIN	Statistical Institute of Jamaica
STP	Sewage Treatment Plant
TPD	Town Planning Department
TPDCo	Tourism Product Development Company
UDC	Urban Development Corporation
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
UTECH	University of Technology
UWI	University of the West Indies
WHO	World Health Organization
WRA	Water Resources Authority (formerly Underground Water Authority)

PREFACE

This Jamaica National Environmental Action Plan (JaNEAP) 2006 – 2009 is the Government of Jamaica's 3-Year strategic action plan to address environmental and physical planning issues.

The JaNEAP 2006 – 2009 represents a comprehensive update of the Actions outlined in the previous JaNEAP 1999 – 2002 and is consistent with new policy priorities of the Government. The internationally agreed development goals, including those contained in the Mauritius Strategy of Implementation (MSI), the Johannesburg Plan of Implementation (JPI), the Millennium Development Goals (MDGs), and the outcomes of other relevant major United Nations conferences and summits provide the overarching framework for tracking environment and sustainable development objectives. This JaNEAP is arranged to cover all the broad thematic issues contained in these multilateral agreements. The Actions developed in the JaNEAP are intended to support the National Sustainable Development Strategy.

The document briefly outlines the environmental issues facing Jamaica and gives an overview of the present state of the environment and economic implications. It summarises progress made over the last seven years towards addressing the issues, and presents a plan for the main actions to be undertaken over the ensuing three (3) year period. A list of indicators is also included, which will provide the basis for measuring over time the outcome of these Actions.

JaNEAP is a national plan containing many Actions and is both sector specific as well as economy wide, hence no single Agency can undertake the responsibility for implementing the entire plan. The various implementing institutions are encouraged to co-ordinate and monitor the progress of their specific actions through their normal Operational Plan's review procedures. Notwithstanding, the NEPA as the Agency responsible for preparing the JaNEAP, will take the primary responsibility for tracking and monitoring the implementation of the Actions identified in this Plan.

The implementation of JaNEAP 2006 – 2009 will be reported on through the publication of an annual JaNEAP Status Report.

The JaNEAP publications are intended to be used:

1. As an information tool to inform the wider public of the actions taken, and actions to be taken by the Government of Jamaica to address environmental issues.
2. As a planning tool by the Public Sector, Funding Agencies, Private Sector, NGOs and CBOs.
3. As a monitoring tool by NEPA.

The JaNEAP is distributed in hard copy to Public Sector Agencies and Ministries and is posted at <http://www.nepa.gov.jm>. It is also available at the NEPA Documentation Centre for reference.

Section 1: INTRODUCTION

A vision for the natural environment

“Give us vision, lest we perish”
Jamaica’s National Anthem

“Xaymaca – Land of Wood and Water “
Arawak Vision of Jamaica

*“I saw my land in the morning and oh but she was
fair
The hills flamed upward scorning”*
I saw my land in the morning - M.G. Smith

Jamaica has undertaken a wide range of visioning exercises over the past eight years. Some of the better-known of these visioning processes include the 2015 Vision developed through the Jamaica Social Policy Evaluation (JASPEV) Project and the UN Civic Dialogue Jamaica 21 Vision.

NEPA is vested with stewardship of the environment and natural resources of Jamaica and is the lead Government Agency responsible for Environmental Management and Spatial Planning in Jamaica. NEPA has articulated the following vision for the protection of Jamaica’s environment

“Jamaica’s Natural Resources are being used in a sustainable way and there is a broad understanding of environment, planning and development issues, with extensive participation amongst citizens and a high level of compliance with relevant legislation”.

National Sustainable Development Framework: Vision 2020

An initiative to establish a National Sustainable Development Framework (NSDF) for Jamaica is being spearheaded by the Cabinet Office and comes within the context of continued efforts at the international and regional levels to promote effective mechanisms for achieving sustainable development goals. Chapter 8 of Agenda 21 calls on countries to adopt national strategies for sustainable development (NSSD).

In 2002, the World Summit on Sustainable Development (WSSD) called on States to “take immediate steps to make progress in the formulation and elaboration of national strategies for sustainable development” and to “begin their implementation by 2005.”

Integrating the principles of sustainable development into country policies and programmes is one of the targets contained in the United Nations Millennium Declaration - The Millennium Development Goals (MDGs) which were adopted by the UN in September 2000. There are eight (8) major global goals for human development. They comprise a set of broad numerical targets, the majority of which are to be achieved by 2015. Goal 7 is to achieve environmental sustainability. This Goal is broken further into three (3) targets (numbers 9, 10 and 11), and eight indicators for monitoring progress (numbers 25 to 32). See table below.

MDG # 7: Environmental Sustainability	
Targets (Millennium Declaration)	Indicators for monitoring progress
Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.	25. Proportion of land covered by forest. 26. Ratio of area protected to maintain biological diversity to surface area. 27. Energy use (kg oil equivalent) per \$1 GDP (at PPP). 28. Carbon dioxide emissions (per capita) and consumption of CFCs (ODP tons). 29. Proportion of population using solid fuels.
Target 10: Halve, by 2015, the proportion without sustainable access to safe drinking water and basic sanitation.	30. Proportion of urban and rural population with sustainable access to an improved water source. 31. Proportion of urban and rural population with access to improved sanitation.
Target 11: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.	32. Proportion of households with access to secure tenure (owned or rented).

The Mauritius Strategy of Implementation (MSI)

The Programme of Action for the Sustainable Development of Small Island Developing States (SIDS/POA) remains a blueprint for SIDS and the international community to address national and regional sustainable development that takes into account the economic, social and environmental issues that are the pillars of a holistic and integrated approach to sustainable development. This process began with the SIDS/POA resulting from the Barbados Meeting in 1994 and was followed by the five-year ministerial review that took place in 1999. The 10-year review of this programme to assess progress made in implementation of the SIDS/POA took place in Mauritius in 2005 and realised the Mauritius Strategy of Implementation (MSI).

Along with the Barbados Programme of Action, the Rio Principles, the full implementation of Agenda 21, the Johannesburg Plan of Implementation and the outcomes of other relevant major United Nations conferences and summits, including the Monterrey Consensus, all contribute to the sustainable development of Small Island Developing States.

Medium Term Socioeconomic Framework (MTSF) 2004-2007 – Environmental Targets

The Jamaica Medium Term Socioeconomic Framework 2004-2007 outlines five policy outcomes and the related indicators to be tracked in the area of the environment over the three year period of the framework. These are indicated in the table below.

Environmental Outcomes and Indicators - The Medium Term Socioeconomic Framework 2004-2007				
Outcome 1: Increased land area under sustainable management	Outcome 2: Improved national and local capacity for hazard risk management.	Outcome 3: No net loss of forest cover	Outcome 4: Reduction of incidence of improper disposal of waste	Outcome 5: Improved environmental practices in the public and private sectors
1. The number of development plans and orders prepared	1. Number of communities in high risk areas that have developed and implemented hazard plans	1. Amount of land planted in forest	1. Proportion of communities with access to adequate solid waste collection facilities	1. Proportion of Government Agencies with Environmental Management Systems
2. Issuance of (%) Stop Orders/Enforcement Notices	2. Proportion of island mapped for: flooding, hurricane, earthquake, landslide		2. Number of industrial facilities meeting NEPA's trade effluent standards	2. Number of hotels with Green Globe Certification and other recognized international certification
3. Number of delegation agreements for Protected Areas and National Parks implemented by NGOs				
4. Ratio of Area protected to maintain biological diversity				
5. Number of informal settlements regularized, Discontinued				

Link between JaNEAP, MTSF and the NSDF

The NSDF is expected to be the overarching and enduring mechanism for guiding and coordinating national efforts and initiatives for sustainable development in Jamaica. The NSDF will outline strategic national actions, governance and institutional arrangements, national targets, indicators and benchmarks, forming the framework for development of both the JaNEAP and the MTSF.

Strategic focus for Environmental Planning and Management

A National Environment and Planning Policy and Strategy (NEPPS)

In 2001, the National Environment and Planning Agency was created as an Executive Agency, from the former Natural Resources Conservation Authority (NRCA), the Town Planning Department (TPD) and the Land Development and Utilisation Commission (LDUC). This initiative was undertaken by the Jamaica Public Sector Modernization Project (PSMP) which saw to the promulgation of the Executives Agencies Act in March 2002.

The diagnostic studies done during the planning and transitional phases of the NEPA, identified the need *inter alia* for the preparation of a National Environment and Planning Policy and Strategy (NEPPS) that will guide, and provide a policy framework for, decisions made (whether nationally or locally) on the development or other uses of the natural, physical and built environments.

In March 2004, NEPA completed the preparation of a draft NEPPS. The NEPPS focuses attention on ten (10) strategic areas outlined below:

1. The Regulatory Framework - Compliance and Enforcement
2. Environmental Awareness and Public Participation
3. Mainstreaming Gender and Diversity Management
4. Economic Incentives and Dis-incentives to promote compliance
5. Spatial Planning [National Spatial Standards/Codes; Development Plans/Orders; Protecting Ecosystems – Watersheds, Coastal Areas & Exclusive Economic Zone (EEZ), Wetlands, Beaches, Coral Reefs; Protecting Green Spaces; Ensuring the Preservation of Prime Agricultural Lands; Ensuring the Preservation of Cultural, Historical and Heritage Sites; and Minimizing the Adverse Effects of Mineral Extraction]
6. Pollution Prevention and Control
[Promoting Environmental Management Systems (EMS); and Managing Land Based Sources of Marine Pollution]

7. Protection & Conservation of Biological Diversity – Habitat and Species Management

8. The National Protected Areas System
9. Disaster and Environmental Emergencies Management
10. Monitoring Environmental and Spatial Planning Indicators

Environmental Goals of JaNEAP

Consistent with the strategic areas of the NEPPS, JaNEAP is intended to facilitate achievement of the following goals:

- i. Improved institutional arrangements for environmental governance and conservation
- ii. A high standard of environmental stewardship and practice is achieved within the private and public sectors, and by consumers.
- iii. The sustainable use of raw materials and the prevention of pollution and contamination through the implementation of waste reduction, recycling and reuse strategies, and improved waste management.
- iv. Environmental health, improved sanitation and environmental quality of life for the population.
 - v. Reduction in emissions of pollutants to air, focusing on pollutants causing human health impacts and ozone depletion, and on pollution originating from transport and industry.
 - vi. Good quality water supplies as well as their sustainable use and protection,
 - vii. Bringing the state of the built environment in conformity with the principles of health protection improved quality of life and sustainable development.
- viii. The conservation and sustainable use of the island's biological resources to the benefit of all.
- ix. Development of a protected area system to ensure, conservation of resources for sustainable use by present and future generations, expansion and diversification of economic development and contribution to public education and recreation.
- x. Enhancement of forest cover to ensure improved watershed and ecosystem services
- xi. The sustainable development of ocean and coastal resources and ecosystems and provision of the conditions of governance required for effective integrated coastal area management
- xii. Ensuring that agricultural practices are carried out in a manner that minimizes the impact on the watershed and water supply while enhancing rural community development.
- xiii. Mainstreaming eco-friendly practices within the tourism sector.
- xiv. Reduction in the environmental impact of the energy sector, the promotion of energy efficient technology development programmes, more extensive

use of renewable energy resources and reduction of greenhouse gas emissions.

- xv. Assessment of the island's vulnerability to disasters and improvement in resilience, including natural resilience, and the cognizance of the impact of climate change, including sea level rise.

Tracking Progress

The internationally agreed development goals, including those contained in the Millennium Declaration, provide the overarching framework for tracking sustainable development objectives.

Funding for Environmental Actions

Most of the Actions outlined in the JaNEAP will be funded through the Government - supported budgets of the respective Agencies. For the most part, the Actions have already been documented in the three (3) year Corporate Plans of these institutions.

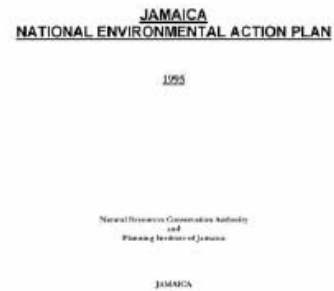
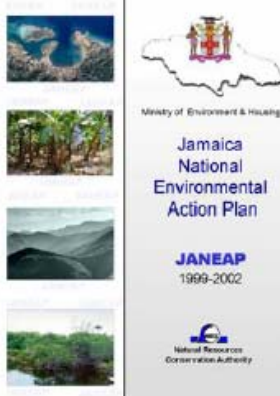
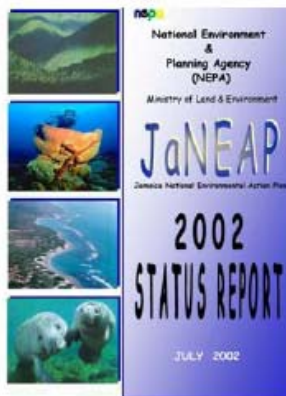
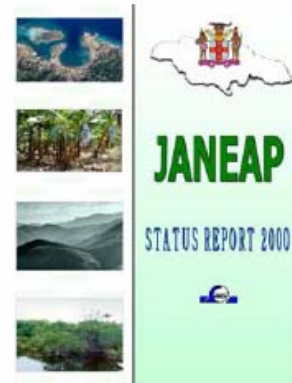
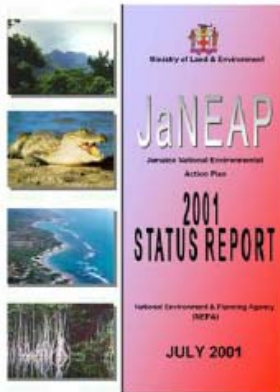
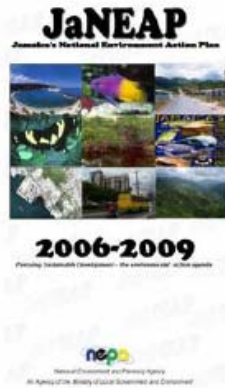
In addition, donor support for projects will continue to be provided by institutions such as USAID, CIDA, UNEP, UNDP and the IADB. One significant opportunity for funding of the resource management-related actions will be the Global Environment Facility through its new Resource Allocation Framework (RAF). Over the next four (4) years, Jamaica will be able to access US\$5.1 million to undertake Biodiversity-related projects and a minimum of US\$1 million and up to US\$3.1 million to undertake Climate Change-related projects.

Strategy for co-ordination and monitoring of JaNEAP

Success in implementing a plan depends on several factors. Coordinating the activities of the relevant institutions and monitoring are two (2) important requisites for successful implementation. However, monitoring of JaNEAP requires close cooperation and commitment on the part of the implementing agencies. As no single organisation is entrusted with the task of implementing all these activities, it is proposed, as was the case with the previous JaNEAPs, that a consultative mechanism be adopted to receive and evaluate information on progress in implementing the various Actions.

Implementing institutions are encouraged to co-ordinate and monitor the progress of their specific actions through their normal Corporate/Operational Plan review procedures. A focal point should be designated by each Agency to act as the channel of communication between the institution and NEPA. A yearly report will be required

from the Agencies on the status of implementation of the Actions, and NEPA will produce an annual JaNEAP Status Report.



Section II: THE STATE OF THE ENVIRONMENT AND ECONOMIC IMPLICATIONS

The State of the Environment

The State of the Environment (SOE) Report presented to the Council of Ministers in November 2005 indicated that Jamaica's environment is under threat from various sources and that the main productive sectors of tourism, agriculture, manufacturing, mining and quarrying are heavily dependent on the island's natural resources such as the beaches, sea, scenic beauty, land, mountains, freshwater and air. The Report noted further that there is a strong correlation between the state of the environment and our vulnerability to natural hazards. Poor environmental practices such as improper disposal of solid waste, indiscriminate removal of forest cover, poor land use practices and squatting, tend to exacerbate the effects of these natural disasters. This has become a concern given the increased frequency and intensity of tropical storms associated with climate change.

Whereas some progress has been made with regard to the establishment of some institutions, the development of policy, legislation and standards, the banning or phase-out of harmful substances, all of which augur well for management of the environment, the lack of resources (financial and human), improper planning for development and the general lack of environmental awareness on the part of the citizenry, manifested in unsustainable consumption patterns and irresponsible environmental practices have hindered effective management of the island's natural resources. There is therefore a general perception that notwithstanding the gains outlined above, the state of Jamaica's environment has been deteriorating.

Those issues of particular concern highlighted in the SOE report include: squatting, pressures exerted by development; improper waste disposal including solid waste, the treatment of sewage and hazardous waste; air pollution; poor land use including degrading forests, strained coastal areas and improper mineral exploitation; the over-exploitation of resources; and threats to biodiversity.

The State of Jamaica's Reefs

Current levels of coral cover contrast with the situation in the 1970s. In the late 1970s, nine (9) reefs on the north coast had live coral cover averaging 52% at 10m depth, but this declined to 3% in the 1990s. Measurements by the UWI Centre for Marine Sciences of fifteen (15) sites in 2005, recorded live coral cover ranging between 0 and 34.38%. While the situation has improved since the 1990s, the island's reefs still remain under threat.

Proportion of Land Area Covered By Forest

The 2004 National Forestry Inventory Report indicates that forests cover 31% of Jamaica's 1,096,416 hectares of land. According to Forestry Department records, there have been slight variations in the percentage of forest cover during the period between 1988 and 2000 as shown in the Table below.

Jamaica's Forest Cover for 1988 to 2000

Year	Natural Forest (ha) (%)	Forest Plantation (ha) (%)	Total Forest (ha) (%)	Reference
1988/89	362,012.9 (33.0%)	3,232 (0.3%)	365,244 (33.3%)	TNC/Grossman <i>et al.</i> 1992
1998	359,365 (32.8%)	10,227 (0.9%)	369,592 (33.7%)	TNC/Li <i>et al.</i> 2000
1989	335,079 (30.6%)	8,856 (0.8%)	343,935 (31.4%)	FD-TFT 1999
1998	332,016 (30.3%)	8,187 (0.7%)	340,203 (31.0%)	FD-TFT 1999
1990			379,000 (35.0%)	FAO 2001b (FRA 2000)
2000	316,000 (29.2%)	9,000 (0.8%)	325,000 (30.0%)	FAO 2001b (FRA 2000)

While natural forest cover has decreased over the period, forest plantation cover has increased. The analysis also revealed that net degradation of forest cover was attributed to an increase in mixed land use and agriculture.

LOCATION	Period	No. of Visits	Faecal Coliform (MPN/100mL)		
			Average	Min	Max
Wag Water River	2000-2005				
Boone Hall Upstream		10	1220	220	1600
Wag Water #1		10	1248	80	1600
Salt River	2000-2004				
Salt River Spring		11	16	2	50
Hope River	2000-2004				
Enfield Bridge		9	606	30	1600
St Ann	2000-2004				
Pear Tree River		10	364	30	900
Dunn's River # 3 (Falls)		10	622	280	1600
Sailor Hole #1 (River)		10	145	2	900
White River #3		10	803	33	1600
Turtle River		10	1037	240	1600

Faecal Coliform levels at selected river sites
(working standard – 100MPN/100ml)

NEPA routinely monitors twenty seven (27) river sites and twenty eight (28) beach sites for water quality. The parameters typically measured are nitrates, phosphates, biochemical oxygen demand (BOD) and faecal coliform. The Table overleaf shows faecal coliform levels at selected rivers and beach sites. As can be expected, the rivers that drain major settlement areas show on average significantly higher levels of faecal coliform.

Air Quality

NEPA has, over the past three (3) years, begun monitoring for air quality but these exercises have been confined to the corporate area. Levels of total suspended particulate (TSP) for sites at Cross Roads and Harbour View in Kingston exceeded the annual standard and indicate the potential for impairment of human health. PM₁₀ concentrations are at present not at levels that are detrimental to human health. See Table below.

Total Suspended Particulates (TSP) at Cross Roads

Year	2006	2005	2004(4 months)	Standards
Annual Average µg/m ³	66.07*	74.53*		60 (µg/m ³)
Number of Sampling Days	54	46	13	45 – 60
Maximum Daily Value µg/m ³	118.28	195.5	219.15	150(µg/m ³)
# of times exceeded	0	1	1	
Minimum Daily Value µg/m ³	32.24	32	7.59	

* Standard not met

Gases (SO₂, NO₂ and CO) are well below ambient standards and are not causes for concern at this time. See the Table below.

Monthly averages for SO₂ and NO₂ (ug/m³) for 2005-2006

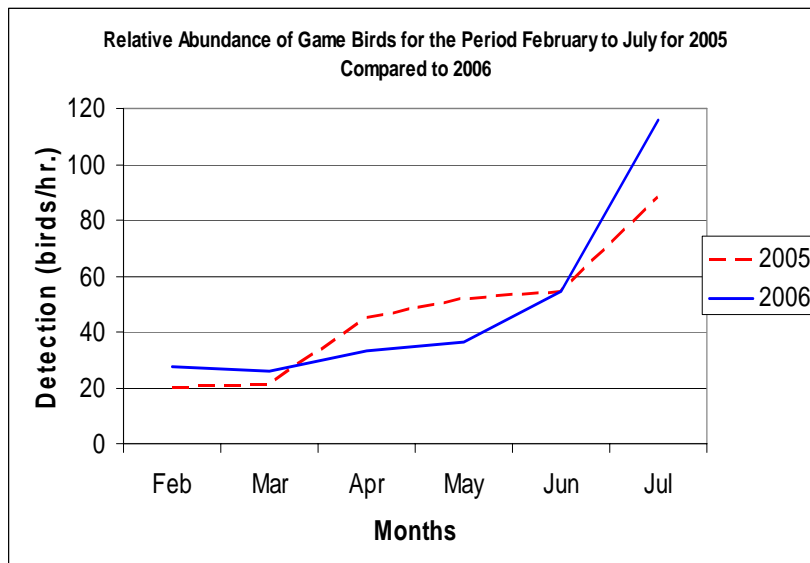
	Oct	Nov	Dec	Jan	Feb	Mar	Annual Standard (ug/m ³)
NO ₂	13.6	11.6	11.6	13.6	15.5	11.6	100
SO ₂	30.3	36.4	33.9	35.4	36.5	34.1	60

Status of Selected Species

Game Birds

A comprehensive study to assess the game bird population in Jamaica began in August 2002. This programme involved surveying the game bird populations (notably, White-winged Doves, Bald-pates, Mourning Doves and Pea Doves) and habitat quality for the period February to June each year.

Relative abundance of game birds increased as the survey progressed from a low of 22 birds detected per hour of observation in February 2005 to a high of 55 birds per hour in June 2005. When compared to the same period in 2006, a similar trend was observed. The lower bird detection recordings from February to March 2005 were due to the effect of the drought. The results of the 2006 survey therefore marks a return to normality when compared to 2005. The results are shown in the graph below.



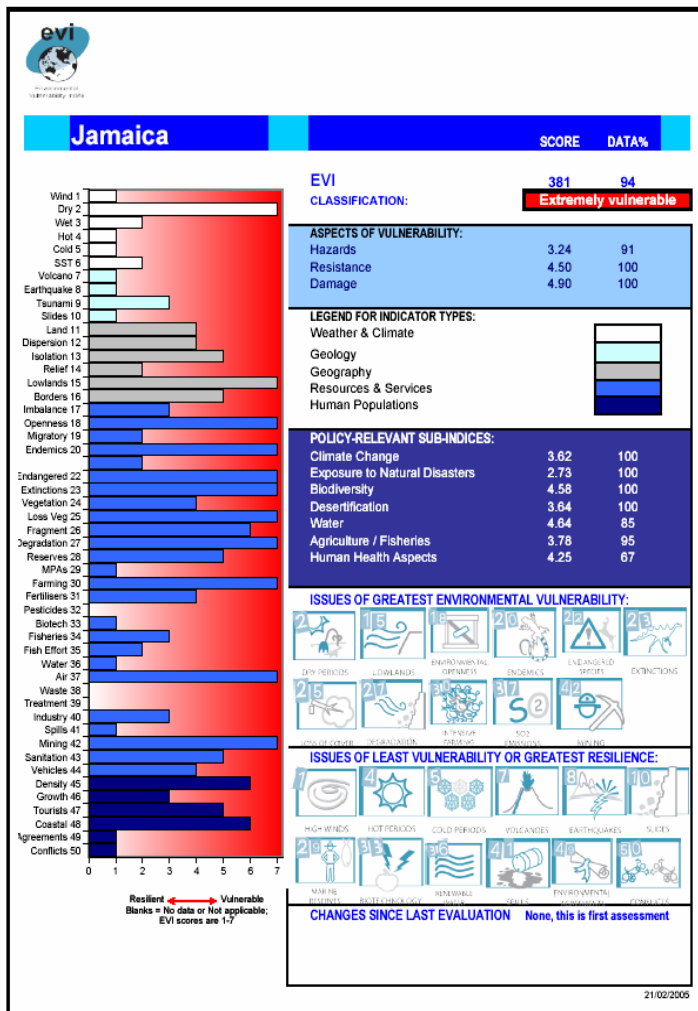
The Jamaican Iguana

The Jamaican Iguana is protected under the Wildlife Protection Act (1945). Both the wild and captive populations have increased over the last eight (8) years. This is due to a 'head start' programme being conducted by the UWI and NEPA. At present there are over one hundred (100) captive iguanas. In 2005, thirteen (13) female iguanas were observed nesting in the wild, however only sixty-four (64) hatchlings were produced. Nineteen (19) were fitted with radio transmitters and released.

The American Crocodile

A survey was conducted in 2005 on nine (9) wetland areas in the south coast parishes covering St. Catherine, Clarendon, Westmoreland, St. Elizabeth and St. Thomas. The highest abundance of crocodiles was noted on the south coast between Black River and Hellshire. Three hundred and fifty seven (357) crocodiles were observed, primarily in rivers and mangrove areas. Subsequent surveys should show an increase in the population.

Environmental Vulnerability



A vulnerability index for the natural environment (EVI) was developed by the South Pacific Applied Geoscience Commission (SOPAC), and the United Nations Environment Programme (UNEP) and presented in 2005. The index was developed through consultation and collaboration with countries, institutions and experts across the globe and is based on 50 indicators (see adjacent figure).

Jamaica participated in this initiative and based on the application of the index, received a score of 381. This means that Jamaica falls in the category of countries that are characterised as being extremely vulnerable. Most SIDS has been determined as being either highly vulnerable or extremely vulnerable. The index is designed for use with economic and social

vulnerability indices to provide insights into the processes that can negatively influence the sustainable development of countries.

Implications for the Economic Framework – The Key Economic Sectors

Growth in the Jamaican economy is estimated to have moved to 1.6 per cent in 2005, relative to growth of 0.9 per cent in 2004. Expansion in the goods producing sectors during the year was principally reflected by growth in construction and mining. Agriculture and manufacturing recorded declines. Services, transport, storage and communication were the main areas of growth. Most of these growth sectors are heavily dependent on the availability and quality of our natural resources.

Mining expanded by 2.8 per cent in 2005. This was below the average growth of 3.3 per cent recorded from 2001 to 2004. This slower growth was attributed primarily to the marginal increase in alumina. For the year, crude bauxite production grew significantly by 21.4 per cent. In this context, capacity utilization in the industry expanded to 90.0 per cent from 74.1 per cent in 2004. However, despite this increase alumina production grew only marginally by 1.6 per cent in the review year, compared to 4.6 per cent the previous year.

The performance of the non-metallic mineral industry reflected an 8.6 per cent increase in cement production in 2005, stemming from reduced competition from imports, as well as growth in the domestic construction sector.

With projected increased investment in the mining sector, bauxite and alumina production is expected to significantly increase over the medium term, therefore important impacts on the environment can be expected. Lands designated for mining which are presently forested or being used for agriculture will lose their forest cover and the inherent biodiversity. Water use and the generation of process waste will continue to increase thereby presenting challenges for disposal. Increases in emissions if not effectively controlled, will result in increased complaints from communities regarding the adverse health impacts and household economic damages.

Export Agriculture declined by 34.0 per cent in 2005 due to significant contractions in the first three (3) quarters of the year. Growth estimated for the fourth (4th) quarter represented primarily the recovery in banana production, following the total destruction of the industry in September 2004 after hurricane Ivan. Despite the anticipated reduction in sugar production from sugar cane, acreages of land in sugar cane are expected to significantly increase with the diversification into ethanol production. The initial conversion of land for sugar cane farming will typically have an adverse effect on biodiversity. The waste generated from new production processes will also be of concern.

The **Services** sector recorded growth in all of the sub-sectors in 2005. The tourism sector is experiencing significant growth due to increased foreign investment. Tourism's direct contribution to GDP is growing in the order of 4.5 % annually. The Government, as part of its industrial policy, has embarked on a number of initiatives to encourage investment in hotel development. Ten thousand (10,000) additional rooms are expected to be constructed over the next five (5) years. Environmental concerns include the location of large hotels in sensitive ecological areas and the removal of local access to these resources, the generation of large amounts of waste and a general deterioration in the quality of the natural environment.

Economic Outlook

The prospects for accelerated domestic economic expansion in 2006 and beyond are encouraging in light of the buoyancy observed in the key sectors in the second half of 2005. In addition, the commencement of projects in mining and tourism is expected to boost economic activity. Performance in 2006 and beyond is expected to be supported by strong private capital inflows, continued expansion in loans from the financial sector and stable macroeconomic conditions. Continued strong growth in the international economy augurs well for expansion in export-related industries. A resurgence of business confidence and improved consumer sentiment should serve to reinforce a positive outlook for investment. The uncertainties associated with international oil prices and adverse weather conditions are negative factors that must be considered. A strategic management programme aimed at anticipating and managing the environmental impacts associated with the growth and liberalization of these key economic sectors should be strongly supported.

Sustainable Consumption and Production

Sustainable Consumption and Production is about achieving more with less. However, environmental impacts from our consumption and production patterns are cause for concern, and inefficient use of resources is both bad for business and the environment. What is needed is a shift to deliver products and services with lower environmental impacts across their life cycle, while at the same time boosting competitiveness. We also need to continue to build on people's growing awareness of social and environmental concerns, and the importance of their roles as citizens and consumers.

Government is promoting Environmental Management Systems (EMS) through its national policy and strategy on EMS, and also enhanced environmental stewardship from the public and private sectors and citizens.

Section III: THE ENVIRONMENTAL ACTION AGENDA

1. THE GOVERNANCE FRAMEWORK and ENVIRONMENTAL STEWARDSHIP

GOAL: Improved institutional arrangements for environmental governance and conservation

Indicators

Indicator	Source of Data
National Sustainable Development Strategy	PIOJ
Number of public consultations related to Environmental Impacts	NEPA
Number of public environmental awareness contacts by NEPA (PSAs, Exhibitions etc)	NEPA
Percentage of environmental regulatory violations that are prosecuted.	NEPA
Expenditure on Environmental Management as a Percentage of GDP	STATIN
Number of Policies subjected to a Strategic Environmental Assessment (SEA)	Cabinet Office
Number of EIAs per sector as against approved developments	NEPA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The establishment of the National Environment and Planning Agency (NEPA)
- The establishment of the Sustainable Development Unit at PIOJ
- NEPA established the “One-Window” applications processing system which is providing a higher quality service to applicants and to the local planning authorities.
- A National Environmental Communications Campaign was launched.
- A Multi-Agency Environmental Enforcement Task Force was constituted
- The Portland Local Sustainable Development Demonstration Project was launched in 2001. A Portland Parish Sustainable Development Profile was prepared.
- A National Sustainable Development Framework is being developed by Cabinet.
- Cabinet approved an amendment to the Guidelines for Cabinet Submissions to require that these Submissions give due consideration to gender issues in policy development. This should ensure the inclusion of gender considerations in all Cabinet Submissions.
- Development of the Strategic Environmental Assessment (SEA) Policy

- The building of capacity within government to undertake Regulatory Impact Assessments.

ACTIONS FOR 2006 - 2009

A. INSTITUTIONS, POLICIES AND LEGISLATION

Action #1.1

The Cabinet Office in collaboration with the PIOJ, MLG&E and NEPA will develop a National Sustainable Development Framework.

Action #1.2

The Cabinet Office will implement appropriate measures to ensure that it has access to adequate information to facilitate informed decision-making in relation to matters that impact the environment and/or are impacted upon by the environment. The Cabinet Office's management of the Natural Resources Committee of Cabinet will play a pivotal role in this regard.

Action #1.3

NEPA will continue to strengthen the Applications Processing System in order to provide an efficient service to clients submitting environmental and planning applications.

B. ENVIRONMENTAL AWARENESS

Action # 1.4

NEPA will continue its routine programme of public education and outreach through regular press releases, maintenance of an environmental calendar, staging various exhibitions and giving talks on the environment to schools, communities and groups.

Action #1.5

In compliance with the Access to Information Act, NEPA will ensure that all information on EIAs is made available to the general public.

Action # 1.6

The Ministry of Education and Youth in collaboration with NEPA will implement the National Environmental Education Action Plan for Sustainable Development (NEEAPSD).

C. MAINSTREAMING GENDER & PUBLIC PARTICIPATION INTO ENVIRONMENTAL MANAGEMENT

Action #1.7

The Government will ensure that all Cabinet Submissions have been analysed for gender considerations.

Action # 1.8

The Government, spearheaded by the Cabinet Office will implement the Consultation Code of Practice for the Public Sector.

Action #1.9

NEPA will implement the EIA guidelines for public participation at public meetings to discuss EIAs.

D. ENFORCEMENT AND COMPLIANCE

Action #1.10

NEPA will develop and implement a Multi-Agency Enforcement Strategy and will increase and strengthen post-permit/approval monitoring to ensure greater compliance.

E. NATURAL RESOURCE ACCOUNTING

Action # 1.11

NEPA will develop a process of incorporating resource valuation into decision making.

Action # 1.12

NEPA will encourage the use of incentives to promote the sustainable management of ecosystem services.

Action # 1.13

STATIN will prepare a Report on the Environment Protection Expenditure Survey.

F. ENVIRONMENTAL ASSESSMENTS

Action #1.14

Cabinet Office will facilitate and monitor implementation of the Strategic Environmental Assessment (SEA) Policy.

Action #1.15

NEPA will review the EIA process on a regular basis to ensure that the process is efficient whilst meeting the objectives of sustainable development. NEPA will continue to request EIAs for proposed developments in sensitive areas and/or those which might have significant negative impacts on the environment. The precautionary principle will be applied and the Agency will insist on improved standards in conducting EIAs.

Action #1.16

The Cabinet Office will refine the environmental checklist developed under both the Environmental Action Programme (ENACT) and the Jamaica Social Policy Evaluation (JASPEV) Project and use it to assess the adequacy of environmental considerations in Cabinet Submissions. This checklist will be of particular relevance in instances where the SEA Policy does not apply.

G. MONITORING ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT INDICATORS

Action # 1.17

The Government, through the Cabinet Office and the PIOJ will develop sustainable development indicators and will use these indicators to monitor Jamaica's progress towards achieving sustainable development.

Action #1.18

NEPA will establish environmental indicators and will report on these in a State of the Environment (SOE) Report prepared in collaboration with the Statistical Institute of Jamaica (STATIN). A SOE will be prepared for 2007 and a Pocketbook of Environment Statistics in 2008.

2. ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS)

GOAL: A high standard of environmental stewardship and practice is achieved within the private and public sectors and by consumers

Indicators

Indicator	Source of Data
Number of Government Ministries/Agencies with environmental stewardship/environmental management programmes	NEPA/Cabinet Office
Number of ISO14001 certified companies	JBS
Number of companies with Environmental Management Systems	JBS
The number of persons trained in Environmental Management Systems	NEPA/MIND/JBS
The number of Demand Side Initiatives	MITEC

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Environmental Management Systems (EMS) Policy and Strategy Green Paper was approved by Cabinet.
- A new corporate planning guide and template was promulgated and includes environmental considerations. Over nine (9) ministries benefited from training on how to incorporate the environment and sustainable development issues into their corporate plans.
- The codes of practice for the Coffee Industry Board was completed and launched.
- The Jamaica Institute of Environmental Professionals (JIEP) was formed.
- Several hotels have received Green Globe certification, four (4) beach sites and one (1) marina received Blue Flag certification.
- The Jamaica Bureau of Standards has developed a training programme in the ISO 14000 series of standards and Hazard Assessment and Critical Control Point (HACCP) analysis.

ACTIONS FOR 2006 – 2009

A. EMS IN THE GOVERNMENT/PUBLIC SECTOR

Action # 2.1

The Government through the MLG&E will implement the GOJ Environmental Stewardship Policy and Guidelines and build the capacity of Ministries and Agencies to incorporate environmental stewardship concepts into government operations.

Action # 2.2

The Government will provide capacity development training in ISO 14000 and HACCP.

Action # 2.3

The Bureau will develop and implement an ISO 14000 Certification Programme and aim for extensive implementation in the public sector.

Action # 2.4

MIND will offer training courses in support of the Greening of Government Programme to include EMS, Environment and Sustainable Development, Strategic Environmental Assessment and Integrated Environmental Management and Planning.

Action # 2.5

PCJ will obtain ISO 1400 certification. The company will adopt a policy of sound environmental management to ensure the well-being of its employees, the public and the environment.

Action # 2.6

The Bureau will develop and implement an ISO 14000 Certification Programme and aim for extensive implementation in the private sectors.

B. EMS IN THE PRIVATE SECTOR/ INDUSTRIES

Action # 2.7

JPSCo will incorporate the most appropriate environmental protection technology for new projects and equipment and will comply with the requirements of national regulatory agencies and donor agencies for the rehabilitation of old units. The company will engage in environmental self-examination through periodic reviews, assessments and audits.

Action # 2.8

NEPA, through the Blue Flag Programme will continue to promote the use of EMS for beaches and marinas.

C. GREEN CONSUMERISM AND DEMAND SIDE MANAGEMENT

Action # 2.9

Demand Side Management (DSM) programmes will be developed for the power sector. The objectives of these programmes will be clearly specified and the institutional arrangements are to be set out in DSM policy guidelines.

Action # 2.10

Government will provide incentives for the use of energy efficient products.

Action # 2.11

The Energy Efficiency Building Code (EEBC) will be promulgated and enforced.

Action # 2.12

A concessionary tax structure will be developed to encourage the use of solar panels and tubes for water heating, and solar systems designed to produce electricity.

3. WASTE MANAGEMENT

GOAL: The sustainable use of raw materials and the prevention of pollution and contamination through the implementation of waste reduction, recycling and reuse strategies, and improved waste management.

Indicators

Indicator	Source of Data
Generation of industrial and municipal solid waste	NSWMA
Collection coverage (%) (solid waste)	NSWMA
Generation of hazardous waste	NSWMA
Sweeping coverage (%)	NSWMA
Tonnage of waste brought to the disposal site (broken out by type)	NSWMA
Rate of waste recycling and reuse	NSWMA
Percentage of population connected to sewerage systems	NWC
Number of Sewage Treatment Plants that meet NRCA's sewage effluent standard	NEPA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The National Solid Waste Management Act was passed and the Solid Waste Management Authority was set up.
- The National Solid Waste Management Policy was approved by Cabinet.
- Wastewater Regulations were gazetted under the NRCA Act. These regulations include discharge fee rates.
- Kingston Restoration Company (KRC) spearheaded work with downtown Kingston communities under a Sanitation and Neighbourhood Clean-up/Maintenance Programme to improve solid waste management, sanitation and beautification within these communities.
- Work started on the Flow West wastewater sewerage system for the Kingston Metropolitan Area (KMA)
- A National Implementation Plan for Persistent Organic Pollutants (POPs) including medical waste was developed.
- The Coffee Industry Board developed a Code of Practice with technical guidelines for environmental management for the industry.
- A Policy for 'Customer Connections to the National Water Commission's Sewerage Facilities' and the Strategy for implementation of this policy was developed. Work in this regard has been ongoing.
- With regard to medical wastes, the Ministry of Health has sought to include in the construction plans and programme of its Regional Health Care facilities, incinerators of better design, greater efficiency and larger capacity with a view to ensuring more appropriate treatment and disposal of medical waste on a

national scale. As such, new incinerators have so far been installed and commissioned at the Mandeville and St. Ann's Bay Regional Hospitals as well as at the May Pen Hospital.

- A Hazardous Waste Management Policy Framework was prepared.

ACTIONS FOR 2006 – 2009

A. GENERAL WASTE MANAGEMENT

Action # 3.1

The Ministry of Local Government and Environment through the Ministry of Finance and Planning will introduce an Environmental Levy on imported goods. The tax collected will be used to implement waste management initiatives.

Action # 3.2

The Ministry of Local Government and Environment will pursue options for the sale of carbon credits on waste minimization initiatives.

Action # 3.3

The National Solid Waste Management Authority will complete all required regulations for the operation of the National Solid Waste Management Act.

Action # 3.4

The NSWMA will assist in devising cost recovery mechanisms by promoting recycling and reuse initiatives for proper disposal of solid wastes.

Action # 3.5

NEPA will implement the Wastewater and Sludge Regulations, including the Discharge Fees component.

Action # 3.6

NEPA will develop and administer a Pollutant Release and Transfer Register (PRTR).

B. SOLID WASTES

Action # 3.7

The Government will take steps to increase the capacity of the NSWMA.

Action # 3.8

Kingston Restoration Company Limited will work with downtown Kingston communities under a Sanitation and Neighbourhood Clean-up/Maintenance Programme to improve solid waste management, sanitation and beautification within these communities.

Action # 3.9

The NSWMA will continue its Environmental Management programme at the Riverton Disposal Site, and will install environmental monitoring programmes at other disposal sites island-wide.

Action # 3.10

The NSWMA will educate/sensitize the public, especially schools, communities, staff and the general public, on solid waste collection, disposal and management issues.

Action # 3.11

The National Solid Waste Management Authority will implement a Code of Practice for the recovery of recyclables, and will provide legal support in the development of recycling programmes.

Action # 3.12

The NSWMA will assist in the formalization of the Solid Waste Sector through the development of licensing regulations, standards and procedures for applicants.

Action # 3.13

The NSWMA will continue to provide collection services for informal communities situated along gullies and riverbanks. In addition, the Authority will focus on providing garbage receptacles in all public areas.

Action # 3.14

The NSWMA will rationalize disposal site locations and improve site operations in the long term. Plans are afoot to find a suitable location for the Doctors Wood Disposal Site, which will eventually be closed because of its potential to create negative coastal impacts.

Action # 3.15

The Ministry of Local Government and Environment will address the problem of non-biodegradable waste such as plastic bottles and styrofoam containers by creating an incentive framework for manufacturers/distributors who employ creative strategies to get the public to return these containers to source.

Action # 3.16

The NSWMA, through its imminent licensing system, will monitor waste management operations and the trade of waste locally and internationally. They will also research the “Best Available Technology” related to sweeping, collection, transportation and disposal of solid waste.

Action # 3.17

The NSWMA will continue to pursue options to divest the collection of solid wastes and solid waste disposal sites to the private sector in 5 to 10 years.

C. INDUSTRIAL EFFLUENTS, HAZARDOUS WASTES AND TOXIC CHEMICALS

Action # 3.18

The NSWMA will improve the development of disposal sites island-wide, and will establish procedures to facilitate the disposal of Hazardous and/or Special Wastes.

Action # 3.19

The MLG&E will advocate for policy development and approval for the management/treatment of e-waste and hazardous wastes, especially used lead acid batteries (ULABs), cell phone batteries, and computers. A hazardous substances and hazardous waste management policy will be developed.

Action # 3.20

NEPA will establish a fee structure based on the quantity and quality of discharge of industrial effluents discharged.

Action # 3.21

NEPA will establish guidelines and codes of practice for at least two industrial sectors each year. Industries will be asked to submit their action plans for compliance and these action plans will be monitored.

Action # 3.22

NEPA will conduct verification monitoring visits to at least 70 industrial locations annually.

Action # 3.23

The Pesticide Control Authority will implement a programme to regulate the sellers and users of restricted pesticides.

Action # 3.24

The Pesticide Control Authority will maintain a register of pesticides imported and manufactured locally.

D. SEWAGE MANAGEMENT

Action # 3.25

Through the NPA for Protection of the Coastal and Marine Environment from LBS/LBA, Government will review and revise the policy, legal and institutional framework to effectively manage the implementation and operation of sewage solutions, and will especially introduce a certification and licensing programme for sewage treatment plant operators.

Action # 3.26

The National Water Commission (NWC) will undertake a study of the costs of sewerage services and review its tariff structure with a view to recovering those costs.

Action # 3.27

Government will seek to develop public/private partnerships in the management of sewerage works.

Action # 3.28

The NWC will pursue a public participatory model for improved wastewater system management in the municipal sewerage districts.

Action # 3.29

A new sewerage system will be established for the KMA.

Action # 3.30

The NWC will embark on a three (3) year sewage rehabilitation, operation & maintenance programme to enable existing sewage treatment systems to function at the level to which they were originally designed. The rehabilitation plan will be monitored by NEPA.

4. ENVIRONMENTAL HEALTH

GOAL: Environmental health, improved sanitation and environmental quality of life for the population

Indicators

Indicator	Source of Data
Percentage of population with access to safe drinking water	STATIN
Percentage of population with improved sanitation	STATIN
Percentage of concentration of faecal coliform in fresh water	NEPA/NWA
Number of incidences of respiratory tract infection caused by Air Pollution	MOH
Number of incidents of lead poisoning	STATIN

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Ministry strengthened its vector control and surveillance programme through training of vector control workers and health professionals in the area of malaria management.
- In collaboration with Pan-American Health Organization (PAHO), the Ministry of Health continued with follow up training for Public Health Inspectors in the areas of Environmental Impact Assessment (EIA) and for the presence of Asbestos Containing Materials (ACM's) as well as in the identification and differentiation of asbestos fibres.
- The Ministry of Health, through the Environmental Health Unit developed an Environmental Health database by means of which comprehensive, continuous up-to-date information on environmental health is readily available.
- A Policy on the siting of cellular towers was developed.

ACTIONS FOR 2006 - 2009

Action # 4.1

The Ministry of Health will reduce and /or control vectors of public health significance, through the application of appropriate source reduction activities, promotion of biological agents or the judicious use of chemicals in communities.

Action # 4.2

The Ministry of Health will promote the development of healthy settings in communities, institutions, and public spaces and lobby for improvements in amenities to protect environmental public health.

Action # 4.3

The Ministry of Health will collaborate with Ministries and Agencies and key stakeholders to promote the application of appropriate onsite wastewater and excreta treatment systems to preserve water quality and public health.

Action # 4.4

The Ministry of Health will lobby Government Ministries and Agencies and the providers of drinking water, including providers of packaged (bottled) water, to ensure that the drinking water quality standard meets the World Health Organization's requirements.

Action # 4.5

The International Centre for Environmental and Nuclear Sciences (ICENS) will continue research into food contamination by heavy metals in Jamaican soils.

Action # 4.6

The ICENS will continue research into the implications of lead nitrate as a result of the smelting of lead acid batteries

Action # 4.7

The ICENS will continue studies on cadmium intakes by humans and possible health effects.

Action # 4.8

The Ministry of Health, in collaboration with its partners and stakeholders, will pursue policies, plans and programmes to enhance occupational and environmental safety and health in the Jamaican workplace.

5. PROTECTION OF THE ATMOSPHERE

GOAL: Reduction in emissions of pollutants to air, focusing on pollutants causing human health impacts and ozone depletion, and on pollution originating from transport and industry.

Indicators

Indicator	Source of Data
Incidences of respiratory tract infection caused by Air Pollution	MOH
Number of anthropogenic sources of emission	NEPA
Number of companies with Action Plans for air emission quality improvement	NEPA
Ambient concentration of air pollution in urban areas	NEPA
Consumption of ozone depleting substances	STATIN

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- Air Quality Regulations were finalized by NEPA
- Stack Emission Standards for fuel combustion, waste treatment, petroleum refining and mineral industries were finalized
- A comprehensive Ozone Depleting Substance (ODS) phase out programme is being implemented by the NEPA
- A ban has been placed on the importation of motor vehicles with air-conditioning units containing CFCs. Consequently, the importation of vehicles over four (4) years old in the case of private cars and over five (5) years old in the case of commercial vehicles has ceased, the rationale being that these vehicles would carry air-conditioning units containing CFCs.
- The Ministerial Order “The Trade (Restriction on Importation) (Chloro-fluorocarbons) Order, 1999” became effective on July 1, 1999. Under this order the importation of CFCs was restricted by quota up to 2006 and was allowed by thirteen (13) importers only.
- The national phase-out of leaded gasoline was completed on April 5, 2000 and there is strict adherence to the Petroleum Quality Act, which was amended in 1999.
- The Ozone Act was drafted and is expected to be promulgated soon.

ACTIONS FOR 2006– 2009

A. AIR QUALITY

Action #5.1

NEPA will implement the 2006 Air Quality Regulations related to emissions and ambient air quality. Air quality monitoring will become a regular exercise.

Action #5.2

The Ministry of Housing, Transport, Water and Works will continue to take steps to reduce emission levels from the transportation sector.

B. OZONE DEPLETING SUBSTANCES

Action # 5.3

NEPA and the MLG&E will continue phasing out the use of ozone depleting substances to fulfill its obligations under the Montreal Protocol and will introduce and implement the Ozone Act.

Action # 5.4

NEPA will continue to educate industries on the use of alternatives to methyl bromide and halons.

6. FRESHWATER RESOURCES: DEVELOPMENT / MANAGEMENT / USE

GOAL: Good quality water supplies as well as their sustainable use and protection.

Indicators

Indicator	Source of Data
Ground water availability and surface water availability	WRA
Annual withdrawals of ground and surface water as a % of total renewable water [Water stress (%)]	WRA
Reach of river polluted (%) - saline intrusion, industrial pollution, sewage pollution, agricultural pollution	WRA
Land area reserved for water conservation	WRA
Percentage of population connected to water supply	STATIN
Water demand by sector	WRA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Ambient Water Quality Standards were finalized.
- The Policy Strategy and Action Plan for the Water Resources Management Sector was completed.
- The WRA, in collaboration with ICENS completed the first phase of a Ground Water Management Information System (GWIS).
- There has been increased commitment of the agriculture sector to the use of Integrated Pest Management (IPM) especially through the use of parasitoids as alternatives to chemical pesticides.

ACTIONS FOR 2006 - 2009

Action # 6.1

The Water Resources Authority will upgrade the Water Resources Information Management System.

Action # 6.2

The Water Resources Authority will rehabilitate and upgrade the National Hydrologic Network.

Action # 6.3

The Water Resources Authority will undertake an assessment of the impact of waste generated by five rum distilleries on ground and surface waters.

Action # 6.4

The Water Resources Authority will implement a water education for teachers programme aimed at increasing awareness of the issues related to the conservation, protection and efficient use of Jamaica's water resources.

Action # 6.5

Ministry of Housing, Transport, Water and Works will implement the strategies and action plan developed for the water sector.

7. LAND RESOURCES: AN INTEGRATED APPROACH TO PLANNING AND MANAGEMENT

GOAL: Bringing the state of the built environment in conformity with the principles of health protection, improved quality of life and sustainable development.

Indicators

Indicator	Source of Data
The number of updated Development Plans and Orders	NEPA
Percentage of population living in urban areas	STATIN
Number of New Low-Income Housing Solutions	STATIN
Number of Housing units provided by Private and Public Sector	STATIN
Number of Household tenure (own, rent or lease)	STATIN

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The National Land Agency was created in 2001
- A South Coast Development Plan has been completed. Tourism, Fisheries and Sewage related projects were identified for implementation as a result of the plan.
- Activities with regard to the creation of a national GIS network are being implemented under the Land Administration and Management Programme (LAMP), through the land information management component. Funding has been allocated for the development of a national meta-data repository, the creation of a multi-purpose cadastral application, the creation of base maps and other land information systems development activities.
- A Kingston & St. Andrew Sustainable Development Plan was prepared.
- A Local Planning Authority was established for Portmore
- Development Plans and Orders are being prepared for Trelawny, Portland, Manchester, Negril, and Santa Cruz.
- The former Ministry of Land and Environment and the Land Information Counsel of Jamaica (LICJ) procured islandwide coverage of IKONOS imagery. This initiative enabled land related agencies to have current and comprehensive base maps of the island, on which other digital information can be superimposed.
- A National Minerals Policy has been developed.
- Geochemical mapping continued. Geochemical maps of the distribution of cadmium and other heavy metals were produced for use by agriculturists and land use planners.

- A Joint Venture Policy for provision of housing was completed and work on a Housing Policy and a Social Housing Policy continued.
- A Developer's Manual was prepared.

ACTIONS FOR 2006 - 2009

A. DEVELOPMENT PLANS AND ORDERS

Action # 7.1

The Government will enact a new Environment and Planning Authorities Act to improve the governance framework at both the national and local levels and promote sustainable development.

Action # 7.2

NEPA will continue to prepare Development Orders to ensure that land development conforms with established standards.

Action # 7.3

Sustainable Development Plans will be prepared for each parish by the Local Authority in collaboration with the MLG&E.

B. LAND ADMINISTRATION

Action # 7.4

The NLA will develop a coherent approach to the management of Crown lands.

Action # 7.5

The Mines and Geology Division of the Ministry of Agriculture will ensure the restoration of mined-out lands by enforcing the mining regulations guiding the restoration of mined-out lands.

C. HUMAN SETTLEMENTS

Action # 7.6

Government will take the necessary action to ensure that adequate housing for workers is made available in tourism growth centres.

Action # 7.7

Government's contribution to the housing sector over the next three (3) years will be in the region of J\$30b, and is to provide shelter for almost 35,000 Jamaicans.

D. LAND INFORMATION SYSTEMS

Action # 7.8

The Land Information Council of Jamaica (LICJ) will continue its activities to harmonize efforts at GIS development in support of the environment and physical planning.

Action # 7.9

The Ministry of Agriculture and Lands and the NLA will develop a national spatial information infrastructure.

Action # 7.10

The ICENS will continue geochemical mapping in Jamaica using state of the art techniques.

Action # 7.11

The Ministry of Agriculture and Lands will establish a Squatter Unit and seek to rationalize squatting and informal settlements.

8. CONSERVATION OF BIOLOGICAL RESOURCES

GOAL: Conservation and sustainable use of the island’s biological resources to the benefit of all

Indicators

Indicator	Source of Data
Population estimate of key species: Endemic Flora, Endemic Fauna	NEPA
Number of management, recovery and action plans; and strategies for threatened/endangered species effectively implemented	NEPA
Declaration of closed seasons and implementation of size limits (Conch, Lobster, Game Birds, Orchids).	NEPA
Number of violations of Wild Life Protection Act (court cases, arrests, warnings etc.)	NEPA
Number of species threatened/endangered	NEPA
Number of reported cases of CITES listed species imported/exported	NEPA
Ratification of International Treaties and Conventions related to Biological Resources and the implementation of local action plans	NEPA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Policy “Towards a National Strategy and Action Plan on Biological Diversity in Jamaica” was completed.
- The Endangered Species (Conservation, Protection, and Regulation of Trade) Act 2000, and regulations governing the trade of Queen Conch (*Strombus gigas*) were promulgated.
- Management/Recovery plans were prepared for the Sooty Tern, the Manatee, Sea Turtles, the Jamaica Iguana, and the American Crocodile.
- An Alien Invasive Species Working Group was established and a list of invasive species was prepared. An Alien Invasive Species Strategy for Jamaica is to be prepared.
- A number of species surveys were conducted including surveys on game birds and the American Crocodile
- The first material transfer agreement was prepared and signed in February 2000 for the collection of deep reef sponges and algae.

ACTIONS FOR 2006 - 2009

Action # 8.1

NEPA will implement the National Biodiversity Strategy and Action Plan.

Action # 8.2

NEPA will undertake island-wide surveys of selected endangered species.

Action # 8.3

NEPA will prepare and periodically revise species management/recovery plans.

Action # 8.4

NEPA will monitor for and eradicate, where possible, invasive species (both flora and fauna) which are impacting the natural environment.

Action # 8.5

NEPA will prepare material transfer agreements for the use and removal from the wild of Jamaica's flora and fauna.

Action # 8.6

The National Commission on Science and Technology will develop and implement a National Bio-Safety Framework.

9. PROTECTED AREAS

GOAL: Development of a protected area system to ensure, conservation of resources for sustainable use by present and future generations, expansion and diversification of economic development and contribution to public education and recreation.

Indicators

Indicator	Source of Data
Protected Areas as a percent of total area (land and marine)	NEPA
Capital investment per year in Protected Areas	NEPA, Forestry Dept, JNHT, Fisheries Div.
Number of Protected Areas Management Plans being implemented	NEPA, Forestry Dept, JNHT, Fisheries Div.
Percentage achievement of output indicators of Operational Plans	NEPA, Forestry Dept, JNHT, Fisheries Div.

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Portland Bight, Palisadoes-Port Royal and Ocho Rios Marine Parks were declared Protected Areas.
- The Black River Lower Morass, the Portland Bight, and Palisadoes-Port Royal were declared Ramsar sites.
- User Fees Regulations for marine parks have been developed
- Delegation Instruments were signed with three (3) NGOs to manage Protected Areas.
- A Protected Areas (5 years) Strategic Action Plan was developed towards establishing a national system that includes Protected Areas declared by NEPA, the Forestry Department, the Fisheries Division and the Jamaica National Heritage Trust (JNHT).

ACTIONS FOR 2006 - 2009

Action # 9.1

The Protected Areas Strategic Action Plan (5 years) will be implemented by the Government, stakeholders and other partners.

Action # 9.2

NEPA will develop and implement Protected Areas User Fee Regulations.

Action # 9.3

NEPA, Forestry Department, the Fisheries Division and the Jamaica National Heritage Trust will continue to collaborate with communities and other stakeholders in the development of Management Plans for declared Protected Areas.

Action # 9.4

NEPA will develop and implement a monitoring and evaluation system for Jamaica's Protected Areas System.

Action # 9.5

NEPA will continue to recommend wetland sites for inclusion in the Ramsar Convention's List of Wetlands of International Importance.

Action # 9.6

Public education material on Protected Areas will be developed.

10. FORESTRY AND WATERSHED MANAGEMENT

GOAL: Enhancement of forest cover to ensure improved watershed and ecosystems services

Indicators

Indicator	Source of Data
Forest area as a percentage of land area.	FD
Annual rate of decrease/increase in forest cover	FD
Change in ranking of the 26 Watershed Management Units	NEPA
Land area of types of forest	FD
Number of bush fires per year	NEPA/MLG&E
Charcoal production per year	STATIN
The number of hectares of land reforested per year	FD
The number of Watershed Management Plans/Strategic Action plans being implemented	NEPA
The number of Local Watershed/Forest Management Committees	FD/NEPA
Percentage achievement of output indicators of management/strategic action plans	FD/NEPA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The National Forest Management and Conservation Plan was completed in 2000
- Cabinet approved the Jamaica Forest Management and Conservation Fund and the Tropical Forestry Conservation Fund in 2002.
- The Forestry Department prepared a draft Patrolling Plan to identify the resources available/required for effective patrolling of the forest estate.
- A Local Forest Management Committee was formed in the Buff Bay/Pencar Valley of Portland
- A National Integrated Watershed Management Council was created
- The Forestry Department continued to produce seedlings and distribute them free of cost to private landowners to be planted on approved lands. Technical advice is being given on the planting.
- The USAID/GOJ Ridge to Reef project implemented watershed programmes in the Rio Grande and Great River Watersheds. Lessons learned will be applied to other watersheds.
- The National Watershed Policy was reviewed.

ACTIONS FOR 2006 - 2009

Action # 10.1

The Forestry Department will implement the National Forest Management and Conservation Plan.

Action # 10.2

The Forestry Department will implement more effective patrolling and policing of transported timber and enforcement laws.

Action # 10.3

The Forestry Department will be strengthened as an institution to fulfill its role to educate the public about trees, forests and the environment and will increase its implementation of environmental education programmes.

Action # 10.4

The Ministry of Local Government & Environment, Ministry of Agriculture and Land, the Forestry Department and NEPA will provide incentives to stakeholders to ensure the protection of the watershed services.

Action # 10.5

NEPA will develop Watershed Management Plans/Strategic Action Plans to establish environmental stewardship in selected watersheds.

Action # 10.6

The Forestry Department will produce 590,000 seedlings by the year 2009.

Action # 10.7

The Forestry Department will review stumpage fees to reflect true market values.

Action # 10.8

The Forestry Department will reforest 300 Ha of public land by 2009.

Action # 10.9

The Forestry Department will reforest 900 Ha of private land by 2009.

Action # 10.10

The Forestry Department will declare additional Forest Reserves.

Action # 10.11

NEPA and the National Integrated Watershed Management Committee will monitor implementation of the Watershed Policy.

Action # 10.12

The Forestry Department, in collaboration with the FAO will assist in the formation of a Tree Growers Association.

Action # 10.13

The Forestry Department will collaborate with other partners in the implementation of the Tropical Forest Conservation Fund.

11. OCEANS, SEAS AND COASTAL RESOURCES

GOAL: The sustainable development of ocean and coastal resources and ecosystems and provision of the conditions of governance required for effective integrated coastal area management.

Indicators

Indicator	Source of Data
Biochemical Oxygen Demand (BOD) and faecal coliform levels in water bodies	NEPA
Number of coastal erosion and beach destruction sites	NEPA
Number of rehabilitated Public Bathing Beaches	NEPA
Number of Blue Flag Certified Beaches	NEPA
Number of Licenses granted to undertake beach modification/improvement works along the coast	NEPA
Number of subdivision and permit application approvals in the Coastal Zone	NEPA
Number of oil spills and fish kills reported per year	NEPA
Percentage of live coral cover	NEPA
Annual catch by major species (Marine fish, Lobster, Conch, Crab, Shrimp etc.)	FD

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- A Council on Ocean and Coastal Zone Management (COCZM) was formed and is now fully operational.
- A policy “Towards Developing a National Policy on Ocean and Coastal Zone Management” was prepared.
- An IDB supported Kingston Harbour Rehabilitation Project was implemented. A public education campaign was a key feature of the Project.
- Fish Stock Assessments were performed on Spiny Lobster- *Panulirus argus*, Queen Conch - *Strombus gigas*, Shrimp - *Penaeus schmitti* and the Atlantic Thread herring - *Opisthonema oglinum*.
- The GOJ/USAID Coastal Water Quality Improvement Project spearheaded initiatives in Negril, Ocho Rios and Port Antonio aimed at improving coastal water quality.
- Four beaches and one marina have received Blue Flag Certification.

ACTIONS FOR 2006 - 2009

Action #11.1

NEPA will develop and implement a comprehensive framework for monitoring the status of Jamaica's coastal and marine resources.

Action # 11.2

NEPA will review and complete an Integrated Coastal and Watershed Atlas.

Action # 11.3

Government will implement the National Oceans and Coastal Zone Policy in order to rationalize Government and Civil Society roles for sustainable management of coastal and ocean resources.

Action # 11.4

Ministry of Agriculture and Lands and the Fisheries Division will develop and implement a National Fisheries Policy.

Action # 11.5

The new Fisheries Bill which is currently being drafted by Government will be completed and enacted.

Action # 11.6

NEPA will review the National Life Guard examination and certification programme with a view to broadening the technical capacity of Life Guards to include environmental awareness.

Action # 11.7

MLG & E will continue the consultative process for the Beach Policy (Green Paper) which is to be reviewed and finalized in the form of a White Paper for approval by Parliament. The Policy will then be implemented.

Action # 11.8

NEPA will continue to work to secure the tenure of Public Beaches

Action # 11.9

NEPA will review and implement the Jamaica Coral Reef Action Plan.

Action # 11.10

The Fisheries Division will be transformed into a performance-based Executive Agency.

Action # 11.11

The Fisheries Division will seek to enhance capacity building in research and development of underutilized fisheries (e.g. diamond back squid, offshore pelagics).

Action # 11.12

The Fisheries Division will develop and implement a pilot project on the use of casitas and condominiums as a means of enhancing lobster populations.

Action # 11.13

The Life Science Department of UWI will collaborate with NEPA on research in the areas of ocean and coastal zone management and protected areas management.

12. SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

GOAL: Ensuring that agricultural practices are carried out in a manner that minimizes the impact on the watershed, water supply and coastal areas while enhancing rural community development.

Indicators

Indicator	Source of Data
Changes in agricultural land use per parish per year	NEPA
Agricultural production of all major crops	RADA
Pesticide/herbicide/fertilizer imported per year	STATIN
Value of agriculture crop loss due to soil erosion	RADA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- RADA has been ensuring the implementation of various soil conservation treatments in all its agricultural (farming) projects. In addition to sensitizing farmers, service clubs, NGOs and institutions (those with farms) have been incorporated in adapting these technologies.
- Farmers have been encouraged largely through on-farm demonstration and other types of farmer training sessions to grow crops organically. In a few instances, material assistance has been given to further encourage this outcome.

ACTIONS FOR 2006 - 2009

Action # 12.1

RADA will encourage integrated crop/pest management in the field through increased extension services.

Action # 12.2

RADA will implement a national pest management plan to protect local agriculture from recently introduced exotic pests.

Action # 12.3

RADA will identify soil conservation treatments such as contour barriers, grassed waterways, check dams, tree orchards, intercropping and minimum tillage suitable for given areas, and encourage and assist farmers to effect same in support of sustainable agriculture

Action # 12.4

RADA will encourage the production of organically produced crops to satisfy the growing demand for health foods by demonstrating organic farming to farmers.

Action # 12.5

RADA will support the promotion of protected agricultural production through the utilization of shade/green house technology, thereby reducing pesticide usage in production practices.

Action # 12.6

STATIN will conduct a Census of Agriculture (2007) to provide; a register of farmers, and reports presenting data on ownership, structure and size of farms, utilization of farm land, cropping patterns, livestock and poultry rearing and use of irrigation.

13. TOURISM AND THE ENVIRONMENT

GOAL: Mainstreaming eco-friendly practices within the Tourism Sector

Indicators

Indicator	Source of Data
Accommodations in Tourism Sector (Number of Hotels, Rooms, Guesthouses, Apartments, Resort Villas)	STATIN
Occupancy level per year	STATIN
Average length of stay per visitor	STATIN
Number and types of eco-tourism facilities	MTEC/TPDCo
Number of hotels with Green Globe Certification	MTEC
Number of registered sites, districts, monuments and structures	MTEC
Number of World Heritage Sites	MTEC
Number of beaches using Blue Flag Certification	NEPA

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- The Master Plan for Sustainable Tourism Development was finalized and implementation has begun.
- The Foundation for Environmental Education in Europe (FEE), the international Blue Flag organization, facilitated through NEPA, the formation of a National Blue Flag Programme
- A number of hotel properties received Green Globe Certification
- A few beaches operated by hotels have received Blue Flag Certification.

ACTIONS FOR 1999 - 2002

Action # 13.1

The Ministry of Tourism, Entertainment and Culture will develop a concept paper to guide research for the development of a policy on ecotourism /heritage / community based tourism in Jamaica, as it relates to the Master Plan for Sustainable Tourism.

Action # 13.2

The Ministry of Tourism, Entertainment and Culture will develop environmental rewards and incentives to encourage hotels and other tourism related entities to adopt Environmental Management Systems and to operate within International Standards for example, ISO 14000 and the Green Globe Award.

Action # 13.3

The Ministry of Tourism, Entertainment and Culture will develop a Policy to streamline and integrate the management of motorized and non-motorized water- based leisure sport in Marine Recreational Areas.

Action # 13.4

The Ministry of Tourism, Entertainment and Culture will coordinate the development of sustainability indicators to gauge and monitor the tourism sector's progress towards achieving sustainable development

14. ENERGY RESOURCES / ALTERNATIVE ENERGY

GOAL: Reduction in the environmental impact of the energy sector, the promotion of energy efficient technology development programmes, more extensive use of renewable energy resources and reduction of greenhouse gas emissions.

Indicators

Indicator	Source of Data
Amount of annual energy consumption per capita	STATIN
Amount of petroleum imports per year	STATIN
Share of consumption of renewable energy resources	MITEC
Number of use of alternative energy technology	MITEC
The number of cogeneration facilities	MITEC
Amount of tax concession on alternative energy technology	MITEC
The number of demand side management programmes	MITEC

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

- A Jamaica Energy Sector Policy was prepared focusing on the development of indigenous energy supplies, energy conservation/efficiency and the environment.
- The first National Communication related to climate change and green house gas production was prepared.
- A 20MW Wind Farm project in Wigton, South Central Jamaica, near Mandeville was completed and commissioned into use.

ACTIONS FOR 2006 - 2009

Action 14.1

The Ministry of Industry, Technology, Energy and Commerce (MITEC) will implement the new Energy Sector Policy.

Action 14.2

The Ministry of Industry, Technology, Energy and Commerce will facilitate the development of all new and renewable energy sources, especially hydropower, biomass, solar and wind energy.

Action 14.3

The Ministry of Industry, Technology, Energy and Commerce will establish a central Energy Conservation and Renewable Unit which will act as a facilitator for all new and renewable energy projects.

Action 14.4

The use of co-generation to meet some portion of electricity supply will continue to be pursued and principles under which the electricity company purchases electricity from co-generators clearly established. (MITEC)

Action 14.5

Demand Side Management programmes will be developed for the power sector. (MITEC)

15. NATURAL AND ENVIRONMENTAL DISASTERS

GOAL: Assessment of the island's vulnerability to disasters and improvement in resilience, including natural resilience, and account for the impact of climate change, including sea level rise

Indicators

Indicator	Source of Data
Amount of Human and economic loss due to natural disasters	PIOJ
Number of weeks over each year that sections of the island have experienced drought conditions	Met Office
Number of category 1-5 cyclones	Met Office
Number of earthquakes causing damage over the last year	Seismic Unit
Total land area affected by flooding each year	ODPEM
Total number of land slides per sq.km	Mines and Geology Dept.
Number of environmental accidents each year	NEPA
Number of people affected by disasters each year	ODPEM

PROGRESS TOWARDS ADDRESSING ISSUES 1999-2006

ACTIONS FOR 2006 - 2009

A. LAND MANAGEMENT AND HAZARD MITIGATION

Action # 15.1

The ODPEM in conjunction with the Ministry of Local Government and Environment will complete and implement the National Hazard Risk Reduction Policy.

Action # 15.2

The Ministry of Local Government and Environment will review the ODPEM Act in keeping with the strategies outlined in the National Hazard Risk Reduction Policy.

Action # 15.3

The ODPEM will undertake a vulnerability assessment of the Agriculture and Tourism Sectors.

Action # 15.4

The ODPEM will continue to ensure the incorporation of hazard information into the development approval process via EIA reviews, hazard assessment for subdivision applications and hazard inventory training for Parish Councils

Action # 15.5

The ODPEM will develop a GIS hazard database, incorporating data on social, economic and environmental parameters.

Action # 15.6

The ODPEM will develop a community vulnerability ranking tool which will be used to rank communities based on vulnerability. It will help to identify priority areas for action.

Action # 15.7

The Mines & Geology Division and the Water Resources Authority will develop hazard risk/vulnerability maps to support the National Disaster Management Plan.

Action # 15.8

The Water Resources Authority will develop and upgrade the flood alert/warning system.

Action # 15.9

The Ministry of Local Government and Environment will work with its Caribbean partners in the development and implementation of a Tsunami Early Warning System.

B. CLIMATE CHANGE AND SEA LEVEL RISE

Action # 15.10

The Ministry of Local Government and Environment will create and/or strengthen the institutional framework to monitor climate variability, climate change and sea level rise impacts on Jamaica and complete the preparation of the Second National Communication on Climate Change.

Action 15.11

The Ministry of Local Government and Environment will facilitate training, technology transfer, surveillance of climate change and the sharing of experiences to assist in preparedness responses to climate change. Emphasis will be on human resource capability in fields such as remote sensing and mathematical modelling.

Action # 15.12

The Ministry of Local Government and Environment will work closely with the Caribbean Climate Change Centre, including work impacting on sea level rise, and climate modelling.

C. OIL SPILLS

Action # 15.13

The Ministry of Local Government and Environment will review and revise the National Oil Spill Contingency Plan. The plan is to take into account hazardous and noxious substances also.

16. MULTI-LATERAL ENVIRONMENTAL AGREEMENTS

Indicator

Indicator	Source of Data
Ratification of MEAs and the implementation of local action plans	MLGE

ACTIONS FOR 2006 - 2009

- A. **The Vienna Convention for Protection of the Ozone Layer (1985) and the Montreal Protocol, 1987**

Action # 16.1

NEPA and the MLG&E will collaborate with the CPC to ensure promulgation of the Ozone Act.

Action # 16.2

NEPA will implement Jamaica's National Halon Bank Management Plan.

Action # 16.3

NEPA will implement a programme to phase out the use of Methyl Bromide in Jamaica.

- B. **United Nations Framework Convention on Climate Change (FCCC), and the Kyoto Protocol (1997)**

Action # 16.4

The Meteorological Office will develop the Second National Communication which will include an Implementation Plan.

Action # 16.5

The Ministry of Local Government and Environment will implement projects through the facility of the Clean Development Mechanism (CDM) of the FCCC.

- C. **Convention on Persistent Organic Pollutants (POPs), Stockholm, 2001**

Action # 16.6

The Ministry of Local Government and Environment will implement a National Implementation Plan (NIP) to achieve the objectives of the Convention.

- D. **International Convention for the Prevention of Pollution from Ships (MARPOL), London, 1973**

Action # 16.7

In keeping with the requirements of MARPOL that homeports be equipped with reception facilities for waste, the Ministry of Housing, Transport, Water and Works will examine a proposal for the construction of such a facility.

- E. **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Basel (1989)**

Action # 16.8

NEPA, through the Natural Resources (Hazardous Wastes) (Control of Transboundary Movement) Regulations, 2002 will control the transboundary movement of hazardous wastes, and monitor and prevent the illegal trafficking of hazardous wastes.

- F. **Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region**

(Cartagena Convention), 1983; Protocol Concerning Pollution from Land Based Sources and Activities (LBS Protocol), Aruba, 1999

Action # 16.9

Government, through NEPA will implement the National Programme of Action for Protection of the Coastal and Marine Environment from Land Based Sources of Pollution.

- G. Convention on Wetlands of International Importance especially Waterfowl Habitat, Ramsar, 1975 (Ramsar Convention)

Action # 16.10

NEPA will designate as necessary, national wetlands of international importance.

Action # 16.11

NEPA will take responsibility for the conservation, management and wise use of migratory stocks of waterfowl and cooperate in the exchange of information for wetlands management.

- H. Convention on International Trade in Endangered Species (CITES), Washington, 1973

Action # 16.12

NEPA, through the Endangered Species (Protection, Conservation and Regulation of Trade) Act, 2000 will regulate the trade in endangered species.

- I. The Convention on Biological Diversity, Rio de Janeiro, 1992

Action # 16.13

Government, through NEPA will implement the National Biological Diversity Strategy and Action Plan

- J. **The Convention on Biological Diversity, Rio de Janeiro, 1992; Protocol on Biosafety, Montreal, 2000**

Action # 16.14

The National Commission on Science and Technology will develop and implement a National Framework on Biosafety including the preparation of a Biosafety Policy and Act.

- K. **United Nations Convention to Combat Desertification (UNCCD), Paris, 1994**

Action # 16.15

The MLG&E will develop and implement a National Action Plan (NAP) related to land degradation and sustainable land management.

List of participating Agencies/Institutions

- Cabinet Office
- Centre for Marine Sciences, UWI
- Forestry Department
- International Centre for Environment and Nuclear Sciences (ICENS)
- Jamaica Bureau of Standards (JBS)
- Jamaica Public Service Company Limited (JPSCo)
- Mines and Geology Division
- Ministry of Agriculture and Lands
- Ministry of Agriculture and Lands – Fisheries Division
- Ministry of Health – Environmental Health Unit
- Ministry of Industry, Technology, Energy and Commerce
- Ministry of Local Government and Environment
- Ministry of Tourism, Entertainment and Culture
- Ministry of Transport, Housing, Water and Works
- National Commission on Science and Technology (NCST)
- National Water Commission (NWC)
- National Environment and Planning Agency (NEPA)
- Office of Disaster Preparedness & Emergency Management (ODPEM)
- Office of the Prime Minister (OPM)
- Petroleum Corporation of Jamaica (PCJ)
- Planning Institute of Jamaica (PIOJ)
- Rural Agricultural Development Authority (RADA)
- Statistical Institute of Jamaica (STATIN)
- The Meteorological Service, Jamaica
- Water Resources Authority (WRA)

APPENDIX B

Reference Documents

1. Draft Medium Term Socio-Economic Framework of Jamaica (2004 – 2007) - PIOJ
2. Jamaica Social Policy Framework- Cabinet Office
3. Scoping Exercise in Preparation of Jamaica Vision 2025: A Framework for Sustainable National Development – Cabinet Office
4. National Environment and Planning Policy and Strategy – NEPA
5. The Millennium Ecosystem Assessment – UNEP
6. The State of the Environment Report 2005 – Ministry of Land and Environment
7. Millennium Development Goals - UNEP