

JaNEAP

Jamaica National Environmental Action Plan

2009

Pursuing Sustainable Development – the Environmental Action Agenda



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APPENDIX A – List of Participating Agencies/Institutions

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 the 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
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
MEM&T	Ministry of Energy, Mining and Telecommunications

MH&E	Ministry of Health and Environment
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 American 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
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

The 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.

JaNEAP 2009 Status Report provides information on accomplishments to date in respect of the Actions outlined in JaNEAP 2006 – 2009.

Progress has been reported on one hundred and twelve (112) of the one hundred and seventy one (171) Actions, while achievements have occurred with respect to most of the other actions.

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.

EXECUTIVE SUMMARY

Governance Framework and Environmental Stewardship: Thirty (30) actions were identified, of which fifteen (15) were completed. These included the strengthening of the development applications processing system, the implementation of the National Environmental Education Action Plan for Sustainable Development (NEEAPSD) and the implementation of training courses in support of the Greening of Government Programme offered by MIND.

Waste Management: Thirty (30) actions were identified to be undertaken. Seventeen (17) actions were completed, three (3) were incomplete and ten (10) partially completed. Examples of actions completed are the introduction of an Environmental Levy on imported capital and the establishment of a municipal wastewater sewage system for the Kingston Metropolitan Area.

Environmental Health Eight (8) activities were identified to be undertaken. Seven (7) actions were completed while one (1) remains incomplete. The International Centre for Environmental and Nuclear Sciences (ICENS) continued to do extensive research into food contamination by heavy metals in Jamaican soils.

Protection of the Atmosphere: Five (5) actions were identified to be undertaken. All five (5) actions were completed. The 2006 Air Quality Regulations related to emissions and ambient air quality were promulgated, and the National Ozone Unit continued execution of projects with the objectives to phase out the use of ozone depleting substances.

Fresh Water Resources: There were five (5) activities targeted for completion. Three (3) actions were completed, one (1) incomplete and one (1) partially completed. Examples of completed actions are the rehabilitation and upgrading of the National Hydrologic Network and the Water Education for Teachers programme aimed at increasing awareness of the issues related to water conservation.

Land Resources: Eleven (11) actions were identified for completion. Four (4) actions were completed, three (3) incomplete and four (4) partially completed. An example of an action completed was ICENS' geochemical mapping of Jamaica.

Biological Resources: Six (6) actions were indentified. All six (6) actions are being implemented. A number of projects are now being implemented in the context of the National Biodiversity Strategy and Action Plan, and island-wide surveys of selected endangered species and the preparation and periodic revision of species management/recovery plans have been ongoing.

Protected Areas: Five (5) actions were completed and one (1) action partially completed. Examples of completed actions are the continued collaboration with communities and other stakeholders in the development of Management Plans for declared Protected Areas and the development and implementation of a monitoring and evaluation system for Jamaica's Protected Areas System.

Forestry and Watershed management: Thirteen (13) actions were identified. Seven (7) actions were completed, two (2) incomplete and four (4) partially completed. The Forestry Department has been strengthened and an Executive Agency created. Over 100 hectares of land annually are being reforested under a private land owner tree planting programme.

Oceans and Coastal Resources: Thirteen (13) actions were identified to be undertaken. Eight (8) actions are completed, one (1) incomplete and four (4) partially completed. The Jamaica Coral Reef Monitoring Network (JCRMN) has established a framework for monitoring of corals and coral reefs and data on live coral cover is being collected at a number of sites across the island. Regular and routine meetings of the National Council on Oceans and Coastal Zone Management are being held in support of the National Policy on Oceans and Coastal Zone Management.

Sustainable Agriculture: Six (6) actions were identified, five (5) of which were completed. The promotion of protected agricultural production through the utilization of shade/green house technology, thereby reducing pesticide usage in production practices was promoted by RADA and hundreds of farmers have been trained in integrated pest management and soil conservation techniques.

Sustainable Tourism: Four (4) actions were identified, three (3) of which are being implemented. The Ministry of Tourism is promoting ecotourism encouraging tourism entities to adopt Environmental Management Systems. A number of facilities have achieved green globe certification.

Energy Resources: Five (5) actions were identified, four (4) of which were completed. The new Energy Sector Policy was completed and an Energy Conservation and Renewable Unit that will act as a facilitator for all new and renewable energy projects was established.

Natural and Environmental Disasters: Thirteen (13) actions were identified to be undertaken. Six (6) actions were completed, four (4) incomplete and three (3) partially completed. Vulnerability assessments of the agricultural and tourism sectors were completed. The incorporation of hazard information into the development approval process via EIA reviews was also undertaken.

The table below provides data on trends related to some indicators identified in the Action Plan.

Sector	Indicator	Trend over last three Years 2006-2009
Governance and Environmental stewardship	National Sustainable Development Strategy	National Development Plan – Vision 2030 was completed
	Expenditure on Environmental protection and conservation as a percentage of GDP	2006/07 - 536.8 M 2007/08 - 526.9 M 2008/09 - 606.6 M
	Number of EIAs done as against approved developments	2007: 104 environmental permits were issued with approximately 30 EIA's evaluated. 2008: 202 environmental permits were issued with approximately 35 EIA's evaluated.
Fresh water Resources	Faecal coliform in freshwater	Of the eighteen (18) rivers being monitored approximately, 40% showed signs of faecal coliform and/or nutrient pollution. Pollution of this nature was largely due to improper disposal of organic waste as well as run off from agricultural lands.
Oceans and Coastal Resources	BOD in water bodies	Beaches generally returned data within acceptable limits measured against historical values.
	Number of oil spills reported annually	Kingston Harbour - the number of small oil spills have remained constant over the last five years, with between 3-4 spills occurring.
	Number of Fish Kills reported annually	This has been fairly constant over the last five years with approximately three to four fish kills reported per year in Kingston Harbour
	Number of Beach Licences granted to undertake coastal modification works	Average of 50-75 issued annually
	Percentage of live coral cover	2008 overall country average of 13.7% . Slight increase over previous years.
	Annual <i>catch</i> by major species (Marine fish, Lobster, Conch, Crab, Shrimp etc.)	Export quota for queen conch (2007- 600,000kg; 2006- 650,000kg, 2005- 600,000kg, 2004- 550,000kg, 2003- 500,000 kg)
Conservation of Biological Resources	Number of Threatened/ Endangered Species	Over the five last years, one species of bat has been noted to be possibly extinct but confirmation is being made; there has been no noted increase in the number of endangered species.
Waste management	Solid waste generation	Approximately 2,500 tonnes of waste is generated daily; of this only 66 per cent is collected.
	Solid waste collection coverage	Collection coverage ranges from 48% - 72%. There are, however, areas which have no refuse collection and others where collection is irregular.
	Composition of solid waste generated	Yard and food waste (also called compostable) is the major form of municipal waste collected by collection agencies (56 per cent of municipal waste). Other main types of waste collected are plastics (18%), paper (9%), metal and tin and paperboard, glass, textiles and wood & board.
	Export of hazardous waste	1,565 tonnes of hazardous wastes were exported in 2006

	Proportion of population using an improved sanitation facility	In 1999 there were 53 public sewage treatment plants compared to 68 in 2006
Sustainable Agriculture	Changes in agricultural land use	The proportion of active farm lands estimated at 65 per cent in 1996 but declined by four percentage points to approximately 61 per cent in 2007
	Quantity of Imported Pesticides	Approximately 1.6 million tonnes of pesticides imported annually between 2000-2006.
	Quantity of Fertiliser Imported and Produced	Declined from 40,000 tonnes in 2002 to 30,000 tonnes in 2006
Forestry and Watershed management	Proportion of land area covered by forest	In 2005, total estimated forested area of Jamaica was 30 per cent of total land
	Number of seedlings produced per year	Since 2007 the Forestry Department has been producing an average of 250,000 seedlings per year.
	The number of hectares of land reforested per year	The Forestry Department planted 102.7 ha and 69.7 ha on public lands during the financial years 2007/2008 and 2008/2009, respectively.
	Annual rate of decrease/increase in forest cover	Recent efforts by the Forestry Department have shown that the actual rate of deforestation is 0.1 per cent per annum.
Sustainable Tourism	Tourists arrivals	Over the period 2000-2007 there has been a 75 per cent increase in the number of cruise passengers and a 34 per cent increase in all other visitors to the island
	Attractions with green globe certification	There are 25 hotels and tourist attraction sites which have attained Green Globe certification.
	Beaches with blue flag certification	Four beaches in the island which have achieved Blue Flag certification
Energy Resources	Energy Consumption	There has been an average annual growth of 2.3 per cent in Jamaica's energy consumption.
	Petroleum energy mix	The share of petroleum in energy supply has grown over the period, to 96.8 per cent by 2006,
	Share of consumption of renewable energy resources	In 2006 hydropower's share of electricity supply was four per cent compared to three per cent in 2002.

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

ACTIONS FOR 2006 - 2009

A. INSTITUTIONS, POLICIES AND LEGISLATION

Action #1.1

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

2007 Report

The PIOJ is spearheading the development of Jamaica 2030 National Development Plan – a 25-year plan designed to put Jamaica in a position to achieve developed country status by 2030. Vision 2030 is based on a fundamental vision to make Jamaica *‘the place of choice to live, work, raise families, and do business’*, and on guiding principles which put ‘people’ at the centre of Jamaica’s transformation.

The preparation of the Plan will be supported by a quantitative systems dynamic model – Threshold 21 (T21) – which supports comprehensive, integrated planning that would enable the consideration of a broad range of interconnected factors along economic, social and environmental considerations and will be used to project future consequences of different strategies across a whole range of indicators. In addition, it will enable Planners to trace causes of changes in any variable or indicator back to the assumptions.

2008 Report

Efforts are being pursued to validate and finalize the Plan through a series of consultations and mass media campaigns. The Plan is expected to be completed by the 3rd quarter of 2008.

2009 Report

A Sustainable Development Unit has been established at the PIOJ.

The preparation of Vision 2030 Jamaica – National Development Plan (NDP) has been completed. It was tabled in Parliament by Prime Minister Bruce Golding on May 5, 2009 following two and a half years of planning, consultations and preparation. The Plan aims to put Jamaica in a position to achieve developed country status by 2030.

The NDP is built around four comprehensive goals. These are as follows:

- Goal 1: Jamaicans are empowered to achieve their fullest potential
- Goal 2: The Jamaican society is secure, cohesive and just
- Goal 3: Jamaica's economy is prosperous
- Goal 4: Jamaica has a healthy environment

The Plan will be implemented and monitored through a series of 3-yearly Medium Term Socio-Economic Policy Frameworks (MTFs) underpinned by a results-based monitoring and evaluation mechanism that establishes specific targets and indicators to measure and track performance. The 31 sector plans (developed during Plan preparation) provide the framework for implementation at the sectoral level.

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.

2007 Report

The Cabinet Office undertook a review of the Strategic Environmental Assessment (SEA) Policy and held meetings with specific Ministries regarding the implementation of the Policy.

2008 Report

The Cabinet Office has developed a Comprehensive Sustainability Assessment Policy (CSAP) Tool. The CSAP Tool establishes a standard for ensuring Public Policies across Ministries are comprehensive and reflect consistently high quality. It also guides Ministries in assessing the sustainability of policies prior to approval and implementation by identifying the most critical social, economic, governance and environmental considerations that should be taken into account in the formulation of Government Policies. The Tool has been finalized out of endorsements from Ministries and efforts are being pursued for widespread dissemination.

2009 Report

The functions of the Natural Resources Committee of Cabinet have been incorporated into the Economic Development Committee of Cabinet. The Cabinet Office continued to review Cabinet Submissions to ensure the inclusion and consideration of environmental impacts as relevant.

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.

2007 Report

NEPA continues to receive an increasing number of applications. Approximately two thousand eight hundred and ninety one (2,891) applications were received last year (2006-2007). Of this number, two thousand three hundred and eighty one (2,381) were processed. Fifty five percent (55%) of these applications were processed within ninety (90) days.

A number of initiatives have been implemented to enhance service delivery in the applications review process. The process has been reviewed to meet critical path criteria, and additional staff and equipment have been retained. Over financial year 2007-2008 NEPA will spend twelve million dollars (J\$12,000,000.00) on the upgrading and customization of the automated Application Management System (AMANDA) to enable clients to have direct online access in tracking their applications. This is, as the Agency continues to focus on improving the process to ensure the effective and timely delivery of its services.

2008 Report

The Agency implemented a 2-tiered system in the processing of applications. Tier 1 applications are considered 'less complex' thereby allowing for a streamlined process

which is expected to result in a 31 day decision process. Tier 2 applications (without EIAs) go through the normal route and steps are being taken to reduce the processing time to 51 days.

Additionally, a number of strategies have been implemented to improve the applications process. These include:

1. A Web-enabled AMANDA (Applications Management) System for access by NEPA staff
2. A re-engineered internal process
3. More Committee meetings
4. Provision for increased numbers/frequency of facilitation sessions with Proponents and Consulting Agencies
5. Hiring of additional staff

2009 Report

Approximately four thousand one hundred and ninety nine (4,199) applications were processed during the year. Included in this amount were two thousand five hundred and ninety five (2,595) planning and environment applications, approximately 65% of which were processed within 90 days.

The public access interface to track development applications online has been operational since July 2008. This has provided information on the major milestones and the current status of development applications being processed by NEPA in real time. As the Application Management System AMANDA is rolled out to the Local Planning Authorities, the same information will become available to them.

The System or AMANDA will be further developed to create a virtual One Stop Shop.

The first phase of the AMANDA roll out to the Local Planning Authorities will be implemented in the first quarter of 2009-2010. This phase will consist of the implementation of AMANDA for subdivision applications of nine (9) lots and under (five (5) hectares) in two (2) pilot sites, Kingston and St. Andrew Corporation (KSAC) and the Manchester Parish Council (MPC). By the end of 2009-2010 all Local Planning Authorities are expected to use the system to manage the processing of subdivision 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.

2007 Report

NEPA's public education and awareness activities increased significantly during the year 2006-2007. The Agency was involved in fifty two (52) exhibitions, a fifty percent (50%) increase over last year and staff participated in fifty nine (59) media interviews. This also represents a fifty percent (50%) increase over the previous year. The number of public presentations and public service announcements also increased significantly.

2008 Report

NEPA teamed with the Jamaica Information Service – Television Division, to produce and 'air' a series of features focussing on the natural environment and work of the Agency.

The first production of this collaboration was aired on *Jamaica Magazine* on May 2, 2007. The television features, which are ten to twelve minutes long, focussed on Jamaica's endangered and protected animals.

The series will serve to clarify the role and functions of NEPA, explore some common misconceptions of what the Agency can and cannot do under law, and examine planning and environmental legislations.

Throughout the year the Agency was involved in over seventy six (76) exhibitions across the island.

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.

2007 Report

An EIA document database was created and is housed in NEPA's Documentation Centre. EIAs are also now routinely posted on NEPA's website. Additionally, public advertisements are routinely placed in the print media indicating the location for viewing EIAs.

2008 Report

EIAs are routinely posted on NEPA's website. Sixty (60) ATI requests were received and responded to.

Action # 1.6

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

2007 Report

The National Environmental Education Action Plan for Sustainable Development [NEEAPSD – Action Plan] was spearheaded by the National Environmental Education Committee (NEEC), with the involvement of the Ministry of Education and Youth (MoEY) as one of its core members.

The Action Plan is for the period 1998 – 2010 with actions expected in five (5) programme areas, with the MoEY having responsibility – as Lead Agency Focal Point – for the two (2) programme areas of *Teacher Professional Development* and *Curriculum Development and Implementation*. A report on the achievements to date in these two areas has been prepared.

2009 Report

The National Environmental Education Committee (NEEC) has the Ministry as one of its core members on the Executive, and is the body responsible for the formulation of the National Environmental Education Action Plan for Sustainable Development [NEEAPSD], with the Ministry being the Lead Agency Focal Point (LAFP) for the two programme areas of – *Teacher Professional Development and Curriculum Development and Implementation*, in the five areas of the NEEAPSD.

a) *Teacher Professional Development 2008-2009*

- EE areas were infused where appropriate, primarily with CSEC Social Studies, Geography and Integrated Science, where there were syllabi changes
- Support continued to be given to the Jamaica Environment Trust (JET) for its teacher training workshops related to the School Environment Programme (SEP) in terms of – some funding, review of workshop presentation materials and attendance at Earth Day celebrations

b) *Curriculum Development and Implementation*

Since EE aspects already embedded in the Revised Primary Curriculum, as well as the National Grades 7 – 9 Curricula for Resource and Technology, (Integrated) Science and Social Studies:

- Work was done with Consultants in the development of Education for Sustainable Development (ESD) materials for use with policy makers, school administrators, teachers and other stakeholders – to be used in the system from September 2009
- Revision of Health and Family Life (HFLE) curricula for grades 1 – 6 and grades 7 – 9 had infusion of some EE aspects

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.

2009 Report

A report on this action is not available.

Action # 1.8

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

2007 Report

The Consultation Code of Practice for the Public Sector was finalized and made available to Government Ministries for guidance.

2009 Report

The Consultation Code of Practice is available on the Cabinet Office's website. The Cabinet Office continues to monitor implementation of the Code by portfolio Ministries.

Action #1.9

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

2007 Report

Public meetings for the presentation of EIAs are being conducted based on the EIA guidelines for public participation. Reports of these meetings are available from NEPA.

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.

2007 Report

Three hundred and nine (309) enforcement actions were taken during 2006-2007. Four individuals were charged in the Resident Magistrate's Court for breaches of the Wildlife Protection Act. They were fined amounts ranging from ten thousand dollars (J\$10,000) to sixty thousand dollars (J \$60,000).

The Agency also continued its focus on post-permit monitoring, as it sought to encourage compliance with the conditions set out in the Permits and Licences granted.

There were two thousand, three hundred and seventy seven (2,377) routine monitoring visits and two thousand, one hundred and twenty one (2,121) post-permit compliance monitoring visits.

2008 Report

In July 2007 the Agency implemented the *ON-SITE Enforcement Written Warning (Ticket)* System to replace the previous verbal warning system. This system is intended to provide better documentary evidence and trigger an earlier response. For the period July 2007 to March 2008, over two hundred (200) tickets were issued. Approximately 80% became compliant after these warnings were issued.

The Agency continued its focus on Post-Permit Monitoring, as it sought to encourage compliance with the Conditions set out in the Permits and Licences granted. One thousand, eight hundred and twenty seven (1,827) Routine Monitoring Visits and one thousand, three hundred and eighty one (1,381) Post-Permit Monitoring Visits were

conducted. Eleven (11) Enforcement Notices were served and eighty (80) warning letters were issued.

A revised Enforcement policy and strategy was prepared. The Policy takes a Multi-Agency approach to policy implementation.

E. NATURAL RESOURCES ACCOUNTING

Action # 1.11

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

2009 Report

Two (2) externally funded projects on resource valuation are now being implemented by NEPA. The projects are focusing on the development of natural resource valuation tools and the economic valuation of protected areas. Outputs from these projects are expected to assist in defining a common approach to enhance efforts in resource management.

Action # 1.12

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

2009 Report

An Integrated Watersheds and Coastal Area Management (IWCAM) Project (started in October 2006) being implement in the Driver's River Watershed in Portland is aiming to use incentives as a strategy to support sustainable watershed practices. Lessons learned will be applied nationally.

Action # 1.13

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

2007 Report

Environment protection refers to actions and activities where the main purpose is to protect the environment from pollution caused by enterprises or industries. Environment Protection Expenditure (EPE) is the cost undertaken in order to reduce, treat or eliminate any pollution or other degradation to the environment which may be caused by the activities of the enterprise.

An EPE survey was conducted during 2005 for the financial year 2004. Questionnaires were delivered to a total of two hundred (200) enterprises in the food and drink, chemical, mining and quarrying and hotel industries.

The report was prepared in 2006 and will be published in the 2007 State of the Environment Report.

2009 Report

The Environment Protection Expenditure (EPE) Survey Report is included in the Environmental Statistics 2007 Report. There are no immediate plans to do another survey on EPE.

F. ENVIRONMENTAL ASSESSMENTS

Action #1.14

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

2009 Report

The Cabinet Office is currently reviewing a Cabinet Note and will advise the Cabinet of the SEA Policy approved by the previous Administration as well as its intention to commence implementation with certain key Ministries.

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.

2007 Report

NEPA is continuously reviewing the EIA process. Discussions have started regarding the certification of Consultants who prepare EIAs. Between 2000 – 2006, two hundred and fourteen (214) EIAs were received and reviewed by NEPA. Most EIAs were in the following categories:

1. Housing developments
2. Hotel developments
3. Sewage treatment and disposal
4. Expansion to bauxite mining ,storage and disposal facilities
5. Ethanol plants
6. Submarine fibre optic cable
7. Incinerators

2008 Report

A number of strategies have been implemented over the year to improve the Applications and EIA review process. These include:

1. A Web-enabled AMANDA (Applications Management) System for access by NEPA Staff
2. A re-engineered internal process
3. More Committee meetings
4. Provision for increased numbers/frequency of facilitation sessions with Proponents and Consulting Agencies
5. Hiring of additional staff

2009 Report

Work progressed on the establishment of a Development Assistance Centre (DAC). The DAC will offer pre-consultation sessions to clients with new projects. It will provide information to clients concerning the project applications process and determine the completeness and or readiness of the application/project concept before submission for approval. Interagency collaboration and coordination would be facilitated by the DAC.

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.

2009 Report

The refinement of the Environmental Checklist has been completed. The Checklist is being used to assess the adequacy of environmental considerations in Cabinet Submissions.

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.

2007 Report

The PIOJ will finalize national indicators as part of the Jamaica 2030 National Development Plan process. See Action 1.1.

2008 Report

See Action 1.1

2009 Report

The PIOJ is to finalize the indicators to monitor implementation of the National Development Plan.

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.

2007 Report

During 2006-07 data collection and research on the topics for the chapters of the SOE commenced. Efforts are also being made to close some data gaps noted while preparing previous publications.

2008 Report

In July 2007 a representative from STATIN attended a workshop on Water Accounting, held in the Dominican Republic, to acquaint countries in the Caribbean and Central America with the techniques involved in environmental-economic accounting on water.

2009 Report

A report *Environment Statistics 2007* was prepared and not the State of the Environment Report as was planned.

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	MEMT

ACTIONS FOR 2006 – 2009

A. EMS IN THE GOVERNMENT/PUBLIC SECTOR

Action # 2.1

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

2007 Report

The Ministry reviewed the Stewardship Policy and has had discussions with selected Government Departments and Agencies. The document will be submitted to Cabinet shortly.

2008 Report

The Environmental Stewardship Policy was again reviewed during 2007/2008. The Ministry of Health and Environment in collaboration with ENACT has finalized the supporting documents and continues to work towards the completion of training programmes and the development of a database and a website.

The final draft of the policy is expected to be submitted in the second quarter of the 2008 – 2009 Financial Year. Policy objectives are to be implemented in phases, beginning with key Government Ministries and Agencies.

2009 Report

Stewardship training and sensitization sessions were conducted in June 2008 in preparation for the implementation of the Policy. Sensitization sessions were held with secondary level students and Youth Ambassadors to the UN General Assembly

and the Ministry of Youth, Sports & Culture. Training sessions were also held with personnel from key Government Agencies and Ministries.

It is anticipated that Cabinet will give approval for the tabling of the Policy in the Houses during the 2009/2010 financial year.

Action # 2.2

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

2009 Report

A report on this action is not available.

Action # 2.3

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

2009 Report

(See Action # 2.6)

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.

2008 Report

The Management Institute for National Development (MIND) scheduled five (5) environmental courses for the Financial Year 2007 – 2008. These courses were:

- Environmental Management for Business Leaders
- Environmental Stewardship for Management
- Strategic Environmental Assessment
- Environmental Stewardship for Administrative Staff
- Environmental Stewardship for Ancillary Staff

The response to the scheduled courses was relatively low, resulting in them not being offered. It must be noted however, that courses were sponsored by NEPA/CIDA,

resulting in more positive interest from the target groups. Since they have been institutionalized at MIND, the general observation is that persons are not as willing to pay the established course fees to participate in Environmental Sustainable Development training.

Consequently, MIND has been focussing on customization to boost participation on these offerings.

2009 Report

For Fiscal Year, April 2008 – March 2009, the Management Institute for National Development (MIND) scheduled five (5) environmental courses for delivery, namely;

- Environmental Management for Business Leaders;
- Environmental Stewardship for Management;
- Strategic Environmental Assessment (SEA);
- Environmental Stewardship for Administrative Staff; and
- Environmental Stewardship for Ancillary Staff.

The courses were designed under the **Greening of Government** project and in keeping with NEPA's JaNEAP: 2006 -2009 programme. They were scheduled to be delivered through out the year (see Table 1 for schedule) and were promoted by way of:

- MIND's Annual Learning Directory;
- Print media;
- Direct promotional efforts with Human Resources Practitioners, General Managers and Supervisors; and
- Announcements during general course administration activities.

Despite the efforts, the uptakes for courses were generally low, and as a result they were not offered. The Institute, through its drive to continuously enhance its courses and programmes and better understand the needs of its clients, (in an aim to be more strategic and responsive), engaged in discussions with business leaders across the public and private sectors to ascertain reasons for the courses not being fully subscribed.

The following are some of the reasons given:

- The courses were not seen as important for business operations in comparison to others such as *Accounting, Human Resource Management, Information Technology, Marketing, etc.*;

- Lack of willingness to pay the established course fees given, which were initially offered without charge under the Greening of Government programme;
- Course duration and times not conducive to the schedule of business leaders

Table 1: Environmental Course Schedule (2008 – 2009)

	Course	Delivery Dates
1.	Environmental Management for Business Leaders	June – September, 2008 February – April, 2009
2.	Strategic Environmental Assessment	February – March, 2009
3.	Environmental Stewardship for Administrative Staff	February, 2009
	Environmental Stewardship for Ancillary Staff	December, 2009
4.	Environmental Stewardship for Management	February – March, 2009

Given the significant value of Environmental Stewardship training on reframing the attitudes and practices of employees across the public and private sectors; enabling them to demonstrate a greater sense of and appreciation of how their roles can contribute to sustainable national development, MIND continues to examine ways in which these courses may be repurposed and promoted to attract greater levels of participation.

Table 2. Summary of Customised Courses in Environmental Training Facilitated

	Course	Organization	Training Duration	# of Participants successfully completed
1.	Sustainable Development & Environmental Stewardship	The Nature Conservancy	April 14 – 29, 2008	24
			June 14, 2008	15
			October 18 -19, 2008	17
2.	Environmental Stewardship	Ministry of Education	June 5 – 26, 2008	12
3.	Environmental Stewardship Workshop (CEO's Office)	MIND	June 6, 2008	29
Total # of individuals trained				97

The Institute has also incorporated environmental issues and principles into a number of courses and programmes, as well as, designed and facilitated customized environmental training interventions. A summary of the related training data is outlined in Table 2.

The MIND team has worked diligently to strategically align environmental sustainability practices and principles in the Agency's operations. MIND therefore promotes a number of *green projects*, as part of its Environmental Management Programme. These include:

- Plastic, Paper and Rainwater Recycling Projects;
- General maintenance of green spaces;
- Use of energy efficient equipment;
- Promotion of general conservation practices; and
- Composting of waste.

MIND has also conducted an **Environmental Impact Assessment** to evaluate the extent to which MIND's environmental initiatives and operations have benefitted the Agency, its surrounding community and the natural environment. To support MIND's environmental initiatives, *Environmental, Procurement and Asset Disposal Policies* were drafted to govern and guide the Agency in operating as per international ISO standards. Additionally, members of the MIND team have been engaged with community members, within the Mona, Hope Pastures and Papine vicinities, in preparing and presenting a research paper entitled, **Potential Contributions of MIND in terms of non-formal Environmental Education within the Hope Watershed in a bid to maintain Sustainable Development**. These initiatives further highlight the MIND's recognition that organizational success is not only determined by financial profitability but more so from the standpoint of the triple bottom line¹.

MIND remains committed to strengthening the Government of Jamaica's (GoJ's) efforts in increasing awareness of the importance of environmental sustainability and stewardship for organizational and national growth. Consequently, as the Government of Jamaica's National Training Institute, MIND will continue to engage in activities that:

- Espouse applied research for the mitigation of deleterious environmental practices;
- Encourage environmentally friendly operational practices at MIND, thus enabling the Institute to be seen as a catalyst for change;
- Facilitate the broadening of MIND's environmental course curriculum in an aim to add new and relevant knowledge to courses and programmes, thus enhancing the impact and value of environmental training;

¹ The Triple Bottom Line – captures an expanded spectrum of values and criteria for measuring organizational (and societal) success: economic, ecological and social, with the bottom lines being: people, profits and community (place). With the ratification of the United Nations TBL standard for urban and community accounting in early 2007, this became the dominant approach to public sector performance management and measurement. Additionally, through focus on TBL, organizations are seen to be aligned to the practices of Corporate Social Responsibility (CSR).

- Facilitate strategic partnerships that aim to build human capacity and institutionalize international best practices; and
- Champion the importance of corporate social responsibility and positive transformation among individuals within the public and private sectors.

Action # 2.5

PCJ will obtain ISO 14000 certification. The company will adopt a policy of sound environmental management practices ensure the well-being of its employees, the public and the environment.

2007 Report

PCJ is in the process of formalizing an environmental management system based on the requirements of ISO 14000. This system will be implemented throughout the group and tailored to the individual needs of its subsidiaries.

2009 Report

An update on this action was not received.

Action # 2.6

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

2009 Report

The Bureau has not developed nor implemented an ISO 14000 Certification Programme. However, it has been engaging in a number of activities related to ISO 14000.

Implementation of ISO 14001 within the Bureau

Effective 01 April 2009, the Bureau, with the aid of a consultancy firm, is in the process of implementing ISO 9001 and ISO 14001 within the organization and ISO/IEC 17025 within its laboratories. The duration of the process is expected to be 48 weeks. Upon completing the process, the Bureau intends to continue to encourage Agencies in the public and private sectors to implement the ISO 9001 and ISO 14001 management systems and provide associated training. Further the Bureau is willing to share its experiences and provide guidance to those who decide to embark upon this process.

IDB MIF/GOJ Project: Implementation of Quality Environmental and Food Safety Systems in Jamaica

The Bureau was the executing agency for the IDB/GOJ Quality Jamaica Project: *Implementation of Quality, Environmental and Food Safety Systems in Jamaica* (Quality Jamaica Project). The Project, which commenced in January 2002, will officially come to an end in September 2009. The Project, which was to improve the international competitiveness among SMEs, was divided into four (4) components:

Component 1 – raise awareness among SMEs regarding the importance of ISO 9000 (quality) and 14000 (environmental) management and HACCP Food Safety Systems. The achievements under this component include:

- Three (3) programme launches were held in Kingston and Montego Bay, three hundred and twenty five (325) persons from SMEs participated.
- Two (2) half-day introduction seminars were held in Kingston and Montego Bay; 86 persons from SMEs participated
- Forty-seven (47) introductory presentations targeting Managers within the SMEs were conducted
- Six (6) stakeholders’ meetings and press briefings were held to inform stakeholders about Match Grant Funding.
- Over seven thousand (7,000) bulletins and promotional information were distributed to various SMEs, informing of the role of the QJP and the various activities to be undertaken.

Component 2 – develop a local supply of qualified Consultants, Auditors and Trainers specifically trained in the implementation of these systems.

Title of Course	No. of Events	Total # of Participants
Requirements Courses (ISO 9000 and 14000)	13	364
Documentation Courses (ISO 9000 and 14000)	10	234
Internal Audit Courses (ISO 9000 and 14000)	14	212
Lead Audit Courses (ISO 9000 and 14000)	3	58
Train the trainer (ISO 9000 and 14000)	3	49
General HACCP	21	1,326
Internal Audit – HACCP	14	364
ISO 22000 Awareness	3	55
Root Cause and Process Mapping	4	105
Total	85	2,768

The previous table provides a status report on the HACCP, ISO 9000 and 14000 training courses:

Component 3 – facilitate the implementation of these systems in approximately 100 SMEs.

Under this component, the target was to reimburse 100 SMEs for technical assistance as a result of implementing ISO 9001/14001 and HACCP systems. These companies would be reimbursed 50 % of the cost of implementation (up to US\$3,750.00) after presenting the relevant supporting documentation. Only 16 companies benefitted from this component. Companies were faced with several challenges; such as, providing financial statements and valid Tax Compliant Certificates. Also, though interested, some companies found the implementation process expensive; thus, were unable to begin the process.

Component 4 – build capacity in the Bureau to enhance its ability to attain international recognition as a Certification Body.

- Six (6) persons who were matriculated as Lead Auditors in ISO 9000 and 14000 and are now recognized internationally to provide audit of Quality and Environmental Management Systems are to be contracted to the National Certification Body of Jamaica (NCBJ).
- Establishment of the NCBJ (see information below).

National Certification Body of Jamaica (NCBJ)

The National Certification Body of Jamaica (NCBJ) was established in April 2007 as the certification unit of the Bureau of Standards Jamaica (as output of Component 4 of the aforementioned project). The mandate of the NCBJ is to offer management systems certification services to ISO 9001 (quality management system) and ISO 14001 (environmental management system) upon achieving accreditation to ISO 17021:2006 *conformity assessment – requirements for bodies providing audit certification of management systems*. The accreditation body that is currently auditing the NCBJ for accreditation is the ANSI-ASQ National Accreditation Board. The first of the two stages of the accreditation audit was successfully completed in June 2009. Stage 2, which involves witness audits, will take place in September 2009.

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.

2008 Report

In 2008, applications were made to the National Environment and Planning Agency for three (3) major activities:

- Upgrade of combined cycle plant (a permitted unit)
- Storage of scrap metal
- JPS submitted an application for an Air Licence dated June 27, 2008 for all Jamaica Public Service Generating Plants.

Jamaica Public Service is in the process of procuring and installing three (3) additional ambient air quality stations. These stations will be installed in the Kingston Air Shed during 2008.

In anticipation of the promulgation of the Wastewater and Sludge Regulations, Jamaica Public Service is currently undergoing detailed wastewater effluent analyses at the Hunts Bay and Old Harbour Plants in order to design suitable wastewater treatment facilities.

Jamaica Public Service continues to undergo internal as well as external audits under the plan-to-act-check model. In the first quarter of 2008, a Jamaica Public Service External Safety and Environmental Audit was conducted.

Action # 2.8

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

2007 Report

NEPA continued its role as National Coordinator for the Blue Flag Programme in Jamaica. Five (5) facilities were awarded Blue Flag (an international eco-label) designation in 2004. The five (5) awardees are Doctors Cave Beach, Norman Manley Sea Park, Merrills' Beach Resort, Port Antonio Marina Beach and the Port Antonio Marina. This is a significant achievement as Jamaica received five out of the twelve Blue Flag Certification awards given to the Caribbean Region for the first time in 2004.

2008 Report

The Negril Environmental Protection Trust (NEPT) was selected to be the National non-governmental organization to operate the Blue Flag Programme in Jamaica. NEPA will embark on a three-year transition phase, during which time the capacity of NEPT will be built to enable this organization to administer the programme in Jamaica.

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 the DSM policy guidelines.

2009 Report

A report on this action is not available.

Action # 2.10

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

2009 Report

A report on this action is not available.

Action # 2.11

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

2009 Report

A report on this action is not available.

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.

2009 Report

A report on this action is not available.

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

ACTIONS FOR 2006 – 2009

A. GENERAL WASTE MANAGEMENT

Action # 3.1

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

2007 Report

The Ministry of Finance and Planning imposed a 0.5% Environmental Levy on all imports effective June 1, 2007.

2008 Report

A levy of 0.5% was placed on all imported goods except for capital goods. The utilization of the funds collected will be discussed with the Ministry of Finance and the Public Service.

Action # 3.2

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

2007 Report

Discussions have been ongoing regarding credit sales for various projects under the clean development mechanism (CDM) of the Kyoto Protocol.

2008 Report

Discussions have been ongoing regarding credit sales for various projects under the clean development mechanism (CDM) of the Kyoto Protocol.

2009 Report

Discussions have been ongoing regarding credit sales for various projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol.

The approval of projects is however on hold pending the completion of a Carbon Emissions Trading Policy to enable Jamaica's participation in the Clean Development Mechanism (CDM) of the Kyoto Protocol and other carbon trading regimes.

(see Action # 16.5)

Action # 3.3

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

2008 Report

The Public Cleanliness Regulations have been in effect and are the bases for the issuance of tickets for littering.

Draft licensing regulations were previously submitted to the CPC and returned for amendments and re-submission. Tipping Fee Regulations are also in draft form and there is need for regulations to address waste diversion (inclusive of waste to energy), collection and sweeping. Amendments to the National Solid Waste Management Act 2001 and repealing of other legislations that are in contravention with it (i.e. aspects of the Public Health Act) are also a necessity. The strategy being employed is to collaborate with the Reform Unit under the Legal Unit of the Local Government Department to undertake the amendments and drafting necessary for the regulatory tools to be utilized by the NSWMA.

2009 Report

Draft Licensing and Registration Regulations amendments were made to the licensing regulations and forwarded to the Ministry of Local Government for review. Tipping Fees Regulations are also in draft form.

Action # 3.4

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

2008 Report

Several prospective Investors are interested in forming business relationships with the NSWMA. These include scrap metal recovery, landfill gas capture for energy and 'waste to energy' processes (i.e. plasma gasification, gasification, pyrolysis and incineration). There is a process to implement 'waste to energy' through a public-private partnership that will guarantee financial and economic returns. A request for proposal associated with the process is to be issued shortly.

Despite no Tipping Fee Regulations or regime, an administrative fee was implemented at all disposal sites; \$500.00 for each visit made to dispose of waste that is commercially generated.

2009 Report

During the year under review, public/community education continued islandwide, where households, communities and schools were encouraged to reuse and recycle waste. A Clean Schools Competition was conducted islandwide, during which schools were challenged to reuse waste items in creative ways to help reduce waste volumes entering the wastestream. This is an annual event.

Composting activities commenced at Riverton and Retirement Disposal Sites. This project facilitates the reuse of grass cuttings from roadways, garden, waste, and market vegetable refuse. The materials are broken down naturally producing a refined product which will then be used as a potting mix to help boost the texture and nutrient content of plant growth. The finished product will be sold to nurseries, individuals and the Parks and Gardens Division of the NSWMA.

Meetings were held with several prospective Investors interested in business relationships with the NSWMA, including recovery of scrap metal, plasma, extracting landfill gas (LFG) and energy from waste, production of ethanol from household waste, gasification and setting up pyrolysis bio fuel plants in the island.

The sale of scrap metal was undertaken during the year as a means of generating income. However, the programme required strict monitoring because of unscrupulous persons engaged in the salvaging of scrap metal without regard for legal stipulations.

NSWMA was instrumental in preparing solid waste management data for the Office of Utilities Regulations' (OUR)'s website information package. Although requests for proposals for electricity generation from renewable sources are now forwarded directly to the OUR, these were reviewed during the year by a GOJ multi-Agency Committee at which the Authority was represented.

The PCJ in collaboration with the NSWMA published a Request for Proposal (RFP) for the construction of two (2) waste-to-energy plants in January of 2009, with a submission deadline of April 30, 2009. At closing, submissions were received from four (4) international companies.

In addition to the above cost recovery initiatives, the Authority introduced an Administration Fees programme which required commercial depositors to pay \$500 per trip to disposal sites. This was introduced as an interim measure to help meet disposal site operational expenditure until the Tipping Fee Regulations are approved.

Plans are being made to utilize the MRF building at the Riverton Disposal site to convert the old tyres at the site and incoming ones into crumb rubber which can then be used as surface material for sports courts (volley ball, netball, track and field), road maintenance, car mats, speed bumps and other products.

Action # 3.5

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

2007 Report

The draft Regulations were reviewed by the CPC. The formula for calculating the Discharge Fees was also included. These Regulations are expected to be gazetted in 2008.

2009 Report

Revised drafting instructions were sent to the Chief Parliamentary Counsel for the Wastewater and Sludge Regulations. It is anticipated that these Regulations will be promulgated in the first or second quarter of the 2010/2011 Financial Year.

Action # 3.6

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

2007 Report

NEPA has started work on developing the database that will support the PRTR.

2009 Report

Work in this area is ongoing and is expected to be further enhanced by the end of 2009-2010 Financial Year.

B. SOLID WASTES

Action # 3.7

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

2007 Report

A report on this action is not available.

2008 Report

The NSWMA was restructured in early 2008, one of the goals being to support the financial sustainability of the organization.

Action # 3.8

Kingston Restoration Company Limited (KRC) 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.

2009 Report

This no longer forms part of the mandate of the KRC and as such no work has been done in this area since the Jamaica Urban Poverty Project ended in 2002.

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.

2008 Report

There is a review of all requests to dispose of hazardous or special wastes. Hazardous materials are only disposed of when the client has a permit from NEPA and if land deposition is an acceptable method of managing the waste.

Covering occurs based on the availability of material. There are significant efforts to meet the requirement because of its role in fire control. There is still no leachate management or landfill gas capture systems at the sites. There are plans to close the coastal sites of Doctors' Wood, Buff Bay and Church Corner, Morant Bay. The diminished disposal capacity will be offset with the implementation of transfer operations.

Water and air quality assessments have been planned for the major sites and those that are located in close proximity to the coastline.

2009 Report

A Landfill Director provides management oversight to all disposal sites islandwide. The Director is assisted by a Landfill Manager and Landfill Supervisors who are responsible for overseeing the daily operational aspects of the sites and to ensure they do not operate below established requirements and standards.

Covering at the respective disposal sites has been vastly improved. Leachate management and landfill gas capture are still on the agenda to be implemented (leachate management by the NSWMA and landfill gas capture from potential investors).

Efforts to restrict unauthorized access to Riverton Disposal were intensified, in order to reduce chances of deliberate ignition by persons of ill intent. Some fires occurred but these were quickly extinguished.

The immediate plan is to close the Doctor's Wood and Church Corner Disposal Sites in Buff Bay and Morant Bay respectively.

The Authority continued to undertake the disposal of hazardous and special wastes, only when land deposition was an acceptable method for disposing of the wastes.

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.

2008 Report

Incentive and competitive programmes were designed and executed for schools, communities and staff. The graphics and messages on each truck help to provide a constant message. Annually, June 6 has been designated 'Solid Waste management Day' and for the period of a week there is a media blitz which incorporates prize giving and acknowledgement of clean schools, exemplary communities and staff.

2009 Report

Visits were made throughout the year to communities, schools and commercial entities islandwide, to disseminate information about waste containerization and proper waste management practices. Public awareness and sensitization sessions were conducted via the media, to promote attitudinal changes in solid waste practices. Information was disseminated to the public island-wide by way of school presentations, community meetings, electronic media and press spots, and media highlights.

The "Clean Schools Competition" initiative which is an annual event conducted by the NSWMA seeks to engender creativity in solid waste management, whilst reinforcing NSWMA's environmental messages. One hundred and forty-nine (149) schools participated this year (2008-2009). At the end of the competition, prizes were awarded for "Cleanest School", "Most Improved School" and "Best Waste-to-Art Project" among others.

Staff members at NSWMA and all regional bodies were constantly informed on good solid waste practices and other environmental information via the quarterly produced magazine "The Compactor". The "Compactor" also highlights major events, programs and training activities undertaken by the Authority. Outstanding employees are highlighted and showcased.

Several groups of students from varying academic institutions (from primary to university level) and other organizations, toured the NSWMA's major disposal sites (Riverton and Retirement) to observe and gain information on the operations that are being utilized. Site visits most often are complemented with a power point presentation on solid waste management and environmental 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.

2008 Report

A Code of Practice has not been implemented but the recycling initiatives that have commenced within the private sector were supported and facilitated through promotion to citizens or entities interested in diverting recyclables.

The plans to develop regulations for waste diversion will include recycling programmes and negate the need for a Code of Practice.

2009 Report

This activity was not completed, due to several legal issues that required the priority attention of the Legal Director and the Board's Legislative Committee during the reporting year.

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.

2008 Report

Guidelines for the containerization of waste were developed for domestic and commercial clients.

As indicated in the status given for Action # 3.3, the development of licensing regulations and standards will be conducted in collaboration with the Reform Unit of the Department of Local Government. On December 1, 2008 the NSWMA will commence the registration of all waste haulers.

2009 Report

The draft Licensing and Registration Regulations were further amended and circulated among members of the Legislative Committee of the Board of Directors for review and recommendation. Upon completion of this stage, the draft will be submitted to the Office of the Chief Parliamentary Counsel for approval. (see also 3.3)

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.

2008 Report

Collection services are provided to areas on the official schedule, which include informal communities. Service continues to be provided to those informal communities along gullies and riverbanks that are accessible for service. Special cleanup of these areas has also been undertaken and solid waste management projects implemented through collaboration with other Agencies and civil society.

Provision of receptacles is dependent on the availability of funds and donations. Public venues, such as markets, hospitals and schools have been the beneficiaries of skips and drums that were provided by companies, and social funds such as CHASE.

2009 Report

Collection service continued or was maintained for informal communities that were already being serviced. The service was extended to others depending on accessibility or the potential for a communal collection point. Drums and garbage receptacles were issued to several communities and public locations islandwide, to encourage good disposal practices by the citizens.

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.

2008 Report

As indicated in the response to Action 3.9, there are plans to close the Doctors Wood disposal site in an environmentally sound manner and implement transfer operations to address the shortfall in the disposal capacity. The considerations and plans being made for waste to energy will not necessitate expansion of the number of disposal sites but more so consolidation. Waste to energy implementation would diminish the

quantity of waste requiring final disposal in a landfill and facilitate development at the operational sites.

2009 Report

The Authority continued to discuss plans to end operations at the Doctors Wood and Church Corner Disposal Sites, which have reached the limits of their waste storage capacities. The alternative that is being pursued during the reporting year is the establishment of a transfer station in Portland/St. Mary from the Doctors Wood vicinity and direct trucking into Riverton from the Church Corner area. (see section 3.9)

Action # 3.15

The Ministry of Health and Environment will address the problem of non-biodegradable wastes 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.

2007 Report

The Ministry will encourage manufacturers/distributors/retailers to, where possible, utilize biodegradable and/or recyclable packaging. Consumers will also be sensitized to the benefits to both human health and the environment from the utilization of these kinds of packaging.

Companies that operate deposit refund or return schemes will be encouraged to continue to implement such schemes.

2008 Report

This is to be addressed with the Ministry of Finance and the Public Service and the National Solid Waste Management Authority.

2009 Report

It was anticipated that the incentive framework for private sector entities which manage plastic packaging wastes would have been dealt with under the Environmental Levy. (Note: For discussion with the Ministry of Finance and the Public Service)

Action # 3.16

The NSWMA, through its imminent licensing system, will monitor waste management operations and the trade of waste locally and internationally. It will

also research the “Best Available Technology” related to sweeping, collection, transportation and disposal of solid waste.

2008 Report

Despite the licensing system not being operational, the NSWMA presently participates in the review process associated with the management of hazardous wastes for local and international export.

Regarding the research on “Best Available Technology”, the NSWMA is in the process of acquiring transfer stations. This is anticipated to allow for gaining collection efficiencies and economies of scale in being able to haul greater quantities to the disposal sites than each collection unit driving long distances and being restricted because of long turn around times.

Collection has been boosted with the procurement of new compactor trucks that have higher compaction ratios and that will allow for greater quantities being hauled when compared to an older truck.

2009 Report

The NSWMA is looking at the possibility of using mechanical sweeping machines to clean major roadways and townships that are normally being swept by hand. This mechanism will minimize accident hazards prone to individuals being on the roadway conducting sweeping activities.

Collection has been boosted with a fleet of new and larger compactor trucks, crane trucks and tipper units.

(See response from 2008 report)

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.

2007 Report

The collection and sweeping activities have been privatized in the Riverton Wasteshed since 2004. Recently new public cleansing zones were established island-wide. All four (4) regions have been zoned and prepared for public tender. MPM has been tendered and the other regions are scheduled to be tendered in the short term; thus paving the way to fully divest collection and sweeping services.

2009 Report

New public cleansing zones were established island-wide. Tendering for collection services were conducted in the MPM watershed, however, the evaluations were placed on hold. Several zones had non-responses.

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.

2008 Report

See Actions # 3.14 and 3.16.

2009 Report

Persons and Agencies wishing to dispose of hazardous wastes are required to obtain a permit from NEPA before NSWMA accepts the waste at the disposal sites. Only designated hazardous wastes are being disposed of at certain sites. Special wastes where necessary are either buried or mixed in with the regular waste then covered.

Action # 3.19

The MH&E will advocate 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.

2007 Report

The Ministry has had several consultations with the relevant Public Sector Agencies and the lead acid battery distribution/retail sector on the development of a sustainable National Programme for the environmentally sound management of used lead acid batteries. One (1) component of this Programme will be the development of legislation to govern the recovery of ULABs from the market place. It is anticipated that this legislation will be in place by the end of the 2007/8 financial year.

National Programmes to govern the environmentally sound management of used and end-of-life mobile phones and accessories as well as computing wastes will be developed and implemented during the 2007/8 financial year. It is anticipated that a

Policy will be developed to address the environmentally sound management of computing equipment wastes.

Work is ongoing on the development of the Hazardous Substances and Hazardous Wastes Management Policy. A preliminary draft of the Policy has been prepared and will be disseminated to a small consultative group of public/private sector stakeholders for comments.

2008 Report

A Policy and Strategy for the environmentally sound management of hazardous wastes has been drafted and is presently being reviewed. Consultations on the draft Policy will be held during the 2008 -2009 Financial Year.

In respect of the environmentally sound management of used lead acid batteries, a National Project for the ESM of used lead acid batteries was implemented in 2006. As a follow-up to the Project, discussions are ongoing with the used acid lead battery sector, NGOs and the relevant Public Sector Agencies with a view to developing a financially sustainable National Programme for the environmentally sound management of used lead acid batteries.

Preliminary discussions were held in 2007 with the main retailers of mobile phones and accessories, with the view to instituting a national programme to address the recovery and export of these products to markets overseas for recycling. Discussions are slated with the major private sector stakeholders in the mobile phone sector for the 2008 – 2009 Financial Year with a view to addressing this issue.

2009 Report

During the 2008/09 Financial Year, it was decided that individual policies would be developed to address issues related to the environmentally sound management of hazardous substances and hazardous wastes, respectively given the complexity of each of the subject matters. In this regard, the policy on the ESM of hazardous wastes would be prepared by the Office of the Prime Minister (Environmental Management Division), while the policy on the sound management of hazardous substances (including chemicals) would be developed by the Ministry of Health (Standards and Regulatory Affairs Division).

The Office of the Prime Minister (Environmental Management Division) has developed the National Policy and Strategy on the ESM of Hazardous Wastes which will be disseminated for stakeholder consultations during the 2009/2010 financial year.

Action # 3.20

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

2007 Report

The fee structure has been developed and incorporated into the draft sewage and sludge regulations.

Action # 3.21

NEPA will establish guidelines and codes of practice for at least two (2) industrial sectors each year. Industries will be asked to submit their action plans for compliance and these action plans will be monitored.

2009 Report

Work has started with the sugar industry and the paint manufacturing sector.

Action # 3.22

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

2007 Report

Over one hundred (100) monitoring visits were made to industrial facilities during the year 2006-2007. The upcoming year will see an increase in the number of inspection visits to these facilities.

2008 Report

Approximately one hundred and thirty (130) monitoring visits were made to industrial facilities during the year 2007-2008. These were related to post permit follow-up investigations, NRCA Section 17 verification and incident report investigations.

2009 Report

A special programme is underway to assess all industrial facilities in the Kingston Harbour watershed and to take enforcement action to ensure that these facilities come into compliance with trade effluent and emission regulations. A report on the initiative will be available in the last quarter of 2009-2010.

Action # 3.23

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

2008 Report

The Pesticides Control Authority has developed a programme to regulate the sellers and users of restricted pesticides. The Pesticides Control Authority maintains and updates a register of sellers of restricted pesticides and a register of users of restricted pesticides. These Registers are available at the Registrar's Office, 2-4 King Street, or on the Pesticide Control Authority's website, www.caribpesticides.net.

2009 Report

The Pesticides Control Authority (PCA) continues to operate its programme to regulate the sellers and users of restricted pesticides. This programme involves requiring sellers to be licensed and to keep detailed records of each sale, including details of the purchaser and what the pesticide will be used for. Many of the restricted pesticides can only be sold to PCA certified users. As users of restricted pesticides, Pest Control Operators are required to be certified and to keep records of pesticide use, while Pest Control Applicators that work for them have to be certified. The operations of both sellers and users are monitored. The PCA maintains and updates registers of sellers of restricted pesticides, Pest Control Operators and Pest Control Applicators (at March 31, 2009, there were 181, 76 and 138 registered persons/companies respectively). These Registers are available at the Registrar's Office, 2-4 King Street, or on the Pesticide Control Authority's website, www.caribpesticides.net.

Action # 3.24

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

2008 Report

The Pesticides Control Authority maintains and updates a Register of Pesticides which is available at the Registrar's Office, 2-4 King Street, Kingston. The Register of Pesticides can be viewed on the Pesticide Control Authority's website, www.caribpesticides.net.

2009 Report

The Pesticides Control Authority maintains and updates a Register of Pesticides which is available at the Registrar's Office, 2-4 King Street, Kingston, and at its Montego Bay office (RADA Building, Catherine Hall, Montego Bay). The Register of Pesticides can be viewed on the Pesticide Control Authority's website, www.caribpesticides.net.

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.

2009 Report

The NRCA sewage and sludge regulations are now before the CPC and are expected to be promulgated early in the 2010-2011 FY.

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.

2007 Report

The study and tariff review has been completed; however a report on the assessment is not yet available.

2008 Report

The National Water Commission has been reviewing the average cost of providing sewerage services based on the different types of sewage systems which the organization operates. In particular, the National Water Commission has reviewed the cost to be borne for treatment of sewage at the newly constructed and commissioned Soapberry Wastewater Treatment Ponds in St. Catherine. Sewage from Kingston and St. Andrew (KSA) is collected through the existing sewerage network and conveyed to the treatment facility.

The Commission's financial information system has some limitation in adequately allocating the indirect cost associated with water supply and sewage operations. It is the intention of the NWC to establish an appropriate system of cost allocation to better enable the organization to determine the true cost of the major components of its operation. This would then be used as a basis for establishing an appropriate sewerage tariff at the next tariff review which is schedule for 2013.

The requested forty-four percent (44%) was not granted by the Office of Utilities Regulation. A twenty-eight percent (28%) increase on water bills will come into effect in May 2008.

Action # 3.27

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

2007 Report

A public/private sector approach has been taken with respect to the construction and operation of the new municipal sewerage works constructed for the KMA at Soapberry.

Action # 3.28

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

2008 Report

The National Water Commission in conjunction with the major Government entities and members of the communities as well as the key stakeholders in the Portland area have formed a Secretariat to review and guide the process for the design and construction of the new wastewater treatment plant to be constructed in the Port Antonio area.

The Commission, where possible, is seeking public participation in such ventures which it believes will result in the improved management of sewerage services.

A public presentation of major improvements to wastewater systems in municipal sewerage districts is conducted on completion of each Environmental Impact Assessment (EIA). The second public presentation for the Port Antonio Water, Sewerage and Drainage Project will be held within the next few months.

Action # 3.29

A new sewerage system will be established for the KMA.

2009 Report

A new municipal sewage treatment plant has been built for the KMA at Soapberry.

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.

2008 Report

There are currently sixty-eight (68) wastewater treatment plants across the islands which are operated by the Commission. National Environment and Planning Agency has identified forty-four (44) of these as critical for immediate improvement works.

The improvement works will involve either rehabilitation of the sewerage system or installing trunk sewers enabling the retirement of the treatment plant. Where trunk sewers are installed, this would be done such that the newly installed sewer is linked to an existing sewage system which can provide improved level of sewage treatment.

The Ebony Vale Sewage Plant in Fraser's district, St. Catherine is just one of the several facilities that will be expanded under the three (3) years rehabilitation plan.

4. ENVIRONMENTAL HEALTH

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

Indicators

Indicator	Source of Data
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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	MH&E
Number of incidents of lead poisoning	STATIN

ACTIONS FOR 2006 - 2009

Action # 4.1

The MH&E 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.

2009 Report

In keeping with the Pan American Health Organization's resolution to adopt the Integrated Vector Management Approach (CE₁₄₂.R₉) for the control of vector, at their 142nd Session of the Executive Committee, Ministry of Health, Jamaica has adopted as policy the utilization of the Integrated Vector Management Approach for the control of the local vector/pest populations.

Integrated Vector Management is a process for managing vector population in such a way as to reduce or interrupt transmission of vector-borne diseases. It employs a rational use of resources through application of multi-disease control approach, and integration of non-chemical and chemical vector control methods.

Component of the IVM are:

- Intersectorial collaboration
- Use of a range of interventions, (biological, physical manipulation, chemical) often in combination and synergistically
- Implementation of methods based on knowledge of factors influencing local vector biology, disease and morbidity
- Engagement with local communities through social mobilization
- A public health regulatory and legislative framework

The Ministry of Health currently in the process of operationalizing this policy through the development of operational guidelines for the implementation of the approach and will be conducting training of all Officers in the programme on Integrated Vector Management by the end of 2009.

Action # 4.2

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

2008 Report

Two (2) Healthy Zones were launched in 2008.

- Longville Healthy Zone in Clarendon was launched in July.
- Sabina Healthy Zone in St. Catherine was launched in May.

There was remedial work still being done on Braeton's Healthy Zone at the end of the year. The Healthy Lifestyle Project came to an end in September and therefore, the assistance that was given to communities for these green spaces came to a halt.

Action # 4.3

The MH&E 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.

2008 Report

The Environmental Health Unit (EHU) reviewed and made recommendations for a total of 668 development projects for the year. 87% of the plans reviewed were approved compared to 75% the previous year which was a direct result of the increased use of the Development and Investment Manual. The EHU met with several Developers, Engineers and Architects throughout the year to guide the decision process regarding the appropriate technologies to be employed for wastewater and excreta management. The Unit also attended 53 meetings, collaborating with other Ministries and Agencies to provide technical expertise and to ensure that development projects were carried out in a manner that did not impact negatively on the quality of the drinking water supply or public health.

Action # 4.4

The MH&E 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.

2009 Report

A report on this action is not available.

Action # 4.5

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

2007 Report

With the exception of cadmium, the concentrations in foods of the potentially toxic elements usually of concern e.g. arsenic, lead, mercury, are generally well below acceptable limits. The definition of high cadmium soil areas and soil/crop relationships has generally been achieved for numerous Jamaican foods. Some foods contain concentrations of this element that are considered unacceptable in some countries, presenting some risk of rejection of such exports. The cadmium uptake by foods is largely determined by soil-Cd concentration and the foods of greatest concern as possible sources of Cd are: ackee, callaloo, carrot, coco, pak choi, sweet potato, yam, cattle kidneys and livers. However other elements may interact with cadmium and these have still to be explored. The ICENS's database now contains enough data to produce accurate maps of soil-cadmium and yam-cadmium distributions that can provide the necessary information for land use decisions, including crop substitution.

2008 Report

Research results to date continue to show that metallic elements are significantly present in the food chain. Intake studies for cadmium (Cd) the element of major interest, have shown that one (1) major determining factor in the cadmium content of foods is the soil concentration and that in some cases cadmium concentration levels in foods exceed internationally accepted export trade standards which have profound implications for land use and crop cultivation. On average, Jamaican foods have Cd concentrations 10 to 20 times higher than those reported in the literature. Root crops (excluding root vegetables) had concentration between 0.004 and 6.5 mg kg⁻¹, root vegetables had from 0.001 to 1.8 mg kg⁻¹ and green leafy vegetables ranged from 0.002 – 1.7 mg kg⁻¹. The concentrations of other elements examined such as Fe, Zn, Cu, K, Ca, Mg and P, all elements essential to healthy plant growth, and other

elements of interest such as Se, As, Co, Cr and Sc, occur in a given food type at more consistent concentrations.

2009 Report

Intensive research work and analysis for cadmium and other “heavy metals” by ICENS have shown that cadmium exists in Jamaican soils at concentrations which are far greater than those found in soils elsewhere in the world and that this substance is transferred in significant amounts in the *soil*→*food*→*human* chain. The high concentrations of this very toxic substance pose two (2) serious risks. Firstly, a high cadmium intake in the local diet could present a serious threat to public health, involving for example, renal diseases, diabetes, hypertension, osteoporosis and perhaps prostate cancer. The incidence of some of these is known to be high in Jamaica and would have serious implications for expenditures in the health sector. Secondly, some Jamaican foods have been shown to contain cadmium at levels which often exceed international trade limits, and this could lead to the loss of agricultural export earnings, and thus impact negatively on the livelihood of the small farming community.

ICENS has now compiled a large amount of data on:

- the occurrence of cadmium and other elements in Jamaican soils, foods and people;
- the dietary patterns and consequent cadmium intakes from food;
- cadmium concentrations and renal function biomarkers in urine;
- characteristics of the study population such as socio-economic status;
- local farming practices; and,
- public health and mortality rates.

Action # 4.6

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

2007 Report

The International Centre for Environmental and Nuclear Sciences (ICENS) continued the work on lead poisoning of children and mitigation of lead hazards. The focus was on inner city areas for which there was already information of a high intensity of lead smelting which had been done in the past, leading in some locations, to extreme contamination. The main sites were in the Kingston Metropolitan Area and included communities such as Drewsland, Marverley, Whitfield Town, Maxfield and Waltham Gardens where back yard battery repair and smelting shops were operated. A total of 120 soil samples were collected from 39 contaminated sites. The school environment such as air/dust, soil and water was also tested for lead along with blood lead analysis

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of 322 blood lead samples of children from 14 schools. Blood lead screening was also provided for residents. Fifty-seven (57) cases of children were found to be lead poisoned according to World Health Organisation standards. For these, mitigation is in progress.

The first *National Report on Chemicals in the Jamaican Environment* has been published. This is a seminal document on lead in our environment.

2008 Report

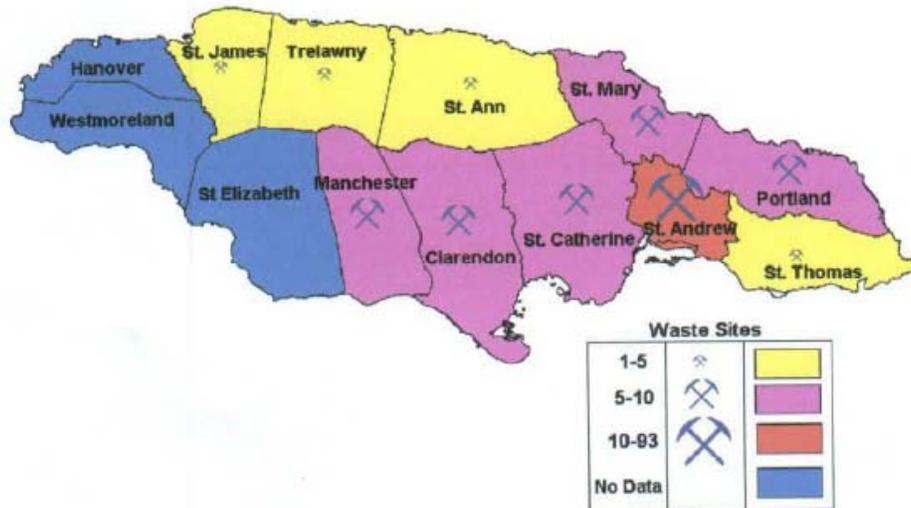
ICENS has continued to assess blood lead levels in the Corporate Area and island-wide, and to identify sources, provide advice and obtain medical treatment as necessary as well as carry out environmental mitigation exercises on identified sources. An investigation of soil lead values and the potential impact on child health which was initiated due to the availability of a list of former lead smelting areas in a densely populated area of Kingston, was completed. Although the soil lead concentrations varied from 6 to a high of 109,000 mg/kg with a mean value of 35,431 mg/kg at the actual sites, these high values were luckily not reflected in the playing areas of neighbouring schools.

Blood lead samples from 322 children aged 2-16 years from the neighbourhood schools were examined. With two exceptions there were no cases requiring immediate medical attention, but as many as 55 (17%) of the 2-10 years old cohort, had blood lead levels between 10 and 20 micrograms per deciliter. Such levels carry some risk, mainly of reduction in IQ levels and the parents have been advised and provided with instructions with regard to nutrition and sanitation to help to reduce exposures. The two (2) severely lead poisoned children were again referred for medical attention; one (1) was chelated yet again. This clearly illustrates the need for long continuing medical follow-up of lead poisoned children and for a system for the disposal of used automobile batteries to prevent further environmental contamination.

2009 Report

The major sources of lead have largely been identified with the parish distributions of backyard recovery of lead from used batteries as shown below. Over 1000 children have been examined and the average blood lead levels have been greatly diminished. A “National Report on Chemicals in the Jamaican Environment: Lead” has been produced.

The parish distribution of the identified smelters island-wide is shown in the Figure below



However, there are still children and adults who were once severely lead poisoned and who keep turning up with blood lead levels in the emergency range. This emphasizes the need for a long continuing national medical follow-up process for victims of lead poisoning. ICENS can continue to contribute by providing education for children, parents and teachers, confirming sources, obtaining medical treatment as necessary assisting with mitigation exercises in communities as necessary, and assisting a private company in their efforts to create an environmentally sustainable business of dealing with used lead acid batteries.

The statistical relationship found in several countries of a link between childhood lead poisoning and murder rates further underlines the importance of reducing childhood lead exposure.

Action # 4.7

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

2007 Report

The most important source of cadmium intake by humans is food. Therefore, elemental food composition tables are being prepared and the cadmium contents of a large number of foods have been determined. Diet and food frequency studies have been conducted on the sample population living in an area which spans the Parishes of St. Elizabeth, Trelawny, Clarendon and Manchester. These indicate that some 95% of the population has Cd intakes well below the WHO limit and, on this basis, should be

at little risk. The other 5% however, show elevated cadmium intakes and have been further examined.

A determination of health consequences of ingestion of cadmium by the Jamaican population is not only complex but difficult as relevant data are mostly unavailable. However, studies indicate that cadmium, though generally associated with several fatal afflictions, does not appear to have a first order effect on mortality in Jamaica. Nevertheless, the results on urine samples indicate that cadmium exposure is contributing to incipient renal tubular dysfunction, a condition that can lead to end stage renal disease. Work in this field will be expanded and intensified as funds become available.

2008 Report

Cadmium intake is mostly through food, hence considerable research has been centered around the preparation of food composition tables. Several methodologies have been employed including chemical analyses of soils, foods, urine, autopsy tissues, blood pressure measurements, surveys and studies of dietary intakes. Several of the high incidence afflictions in Jamaica: for example, diabetes, hypertension, prostate cancer, end-stage renal disease, have in other countries, been associated with cadmium and there is evidence of significant cadmium intake amongst Jamaicans.

Despite the high values being found, for example, in urine and human organs, the original extremely high levels of cadmium generally found in Jamaican soils do not appear to be having a significant impact on the health of the Jamaican population. No clear patterns are observable from mortality date/soil cadmium relationships although there is the hint of a relationship with diabetes. On the other hand, the kidney is the main target for cadmium and examination of urine samples shows evidence of incipient renal tubular damage disease which correlates with cadmium exposure. Cadmium, just like any other metal, has the capacity to interact with other micronutrients (chromium, magnesium, zinc, selenium, and iron, among others) with similar physical and chemical properties, and this interaction may change the mechanism of absorption of this metal by the body, either accelerating or decreasing its toxicity. A significant body of data is now available however on cadmium and other elements in the Jamaican environment and this work is continuing.

2009 Report

Several foodstuffs have been examined, relationships between soil content and food uptake defined and exposures measured for a population in central Jamaica. While it is clear that there is significant human uptake, as in a few other locations, we can find no clear link between cadmium uptake and human distress in macro indicators like increased mortality and/or morbidity in the local population. For example, neither life

expectancy nor median ages of death show cadmium-related geographical distributions.

Data has been obtained on human exposures to cadmium through the diet for a population in central Jamaica and compared with the occurrence of several of the high incidence afflictions in Jamaica; e.g. diabetes, hypertension, prostate cancer, end-stage renal disease (the kidney is the main target for cadmium). No relationship has yet been found. In view of the remarkable concentrations of cadmium involved in Jamaica, and often contradictory reports in the literature, it appears that much remains to be learned about certain details of cadmium toxicity.

A detailed study of the concentrations of heavy metals including cadmium in blood, hair, urine and various tissues of Jamaicans as functions of age, gender, geographic distribution, and where it is relevant, health status is beginning, which will examine the possibility of interactions between elements which incidentally may be protecting Jamaicans from cadmium. This is important but has perhaps little immediate bearing on the regulations which are presently in force.

Action # 4.8

The MH&E, 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.

2008 Report

The Ministry of Health continues to build capacity to foster improvement of the nation's Occupational Environmental Safety and Health status. In 2008, four (4) Public Health Inspectors were awarded the Masters of Science degree in Occupational Environmental Safety and Health from the University of the West Indies. They were among the first cohort for that programme. There were five (5) other Inspectors at varying stages of completion.

The Ministry worked to form a safer environment through inter-Agency linkages and to achieve public health risk reduction. There was active participation on a number of Committees in the formulating and reviewing of key OESH policies/guideline documents. The main emphasis was on Occupational Safety and Health, Hazardous Waste Management, Medical Waste Management, Chemical Management and the Scrap Metal trade. Through collaboration with NEPA there was technical support and regulatory oversight in the management of Asbestos.

The MOH also partnered with PAHO/WHO, focusing on protecting the health and safety of healthcare workers in Healthcare Facilities and through this collaborated effort a two (2) days workshop was conducted. The discussions as to the

strengthening of the local policy frame work through international linkages and support continues.

Drinking Water

The monitoring of drinking water supplies across the 14 parishes continues, through the bi-weekly site visits and sampling by the health departments. Drinking water samples are routinely tested for microbiological parameters such as coliforms and *escherichia coli*, among others, however, there are severe limitations in the routine testing of chemical contaminants and toxins such as lead, mercury, arsenic and other heavy metals; disinfection by-products such as the trihalomethane chloroform, and chlorinated acetic acids; as well as organic pollutants and pesticides. Enforcement of the required annual screening for these contaminants is restricted due to limited public health and private laboratory capacity.

The major supplier of piped water, the National Water Commission, which supplies over 90% of all drinking water, continues to provide safe drinking to most of its customers. Efforts have been made in recent times to also improve the supply of drinking water through the construction of new plants or the expansion of existing ones. Increasing the amount of treated drinking water available to the public is seen as a benefit to public health by restricting the public from seeking water from sources that may be unsafe.

One of the more recent water supply expansions was that of the Spanish Town Treatment Plant, which supplies water to most of Spanish Town, large sections of Portmore, Kingston and St. Andrew. This Treatment Plant was recommended by the Environmental Health Unit as a candidate for the implementation of a World Health Organization (WHO) led water Safety Plan Demonstration project and is among the first in the world to have developed this plan based on WHO guidelines. This project was conducted in collaboration with the Centre for Disaster Control, Pan American Health Organization (PAHO) and the Caribbean Environment Health Institute (CEHI) as well as focal representatives from the Water Resources Authority, National Water Commission (NWC), Parish Councils, Health Departments, and the National Irrigation Commission among others. NWC operators and other private providers were trained in the use of water safety plans, as a tool for improving water quality.

Packaged (bottled) water is monitored by the health departments, through routine sampling and site visits and the processing of applications for public health approvals. There are other Agencies of note involved in the monitoring of packaged water, viz, the Bureau of Standards Jamaica, the Water Resources Authoring (WRA) and to some extent the National Environment and Planning Agency (NEPA). The programme for monitoring is an inter-Agency one with each Agency playing a unique role and sharing data, however, the established Committee needs to be restored with the selecting of a lead Agency.

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	MH&E
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

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.

2007 Report

Ambient air quality monitoring started in the Kingston Metropolitan Area (KMA) in 2004. The parameters of interest are those gazetted in 1996 as ambient air quality standards; particulate matter (TSP and PM₁₀), (TSP = Total Suspended Particulate. PM₁₀ = particulate matter of diameter equal to or less than 10 micrometers) sulphur dioxide (SO₂) and nitrogen dioxide (NO₂). Three (3) sites in Kingston and one (1) in St. Ann are currently being monitored.

2008 Report

Total Suspended Particulates (TSP) in the Cross Roads area have improved over the past three (3) years and are now just meeting the annual standard. An improvement in particulate levels at Harbour View was observed. This was not the case at the Old Hope Road station, which saw an increase in Total Suspended Particulate levels, though the readings were still well within the standard.

PM₁₀ values are presently not at levels that are detrimental to human health at the two (2) stations where they are monitored.

In 2006 the gases (SO₂ and NO₂) were well below ambient standards and were not a cause for concern. It is hoped that by February 2008 we will be able to put the SO₂ analyser back into operation.

The main objective of the Ambient Monitoring Programme is to ascertain the population's exposure to the parameters being used by the programme. In the near future information from the Ambient Monitoring programme will be combined with other Air Quality Programmes (e.g. Stack Emission Monitoring, Post Permit & Licence Monitoring) to present an overall picture of air quality in the country, and its impact on human health and the environment.

2008 Report

The site at Cross Road exceeded the annual standard for the period under review. While this is cause for concern it is not surprising given the level of influence from industrial facilities as well as motor vehicle exhaust.

Action #5.2

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

2009 Report

The Island Traffic Authority (ITA) in its general capacity is the entity with responsibility for undertaking the testing of vehicles to ensure fitness, road-worthiness and general compliance with standards of safety, and conducts emission inspections of motor vehicles by way of physical observatory examinations. This entails assessing on a qualitative basis, the level of smoke that is emitted from the tail pipe of motor vehicles.

Currently the ITA is being modernized and has as a part of its plans for the next financial year, the acquisition of the necessary equipment that would be able to provide improved emissions testing and information of a more qualitative nature.

B. OZONE DEPLETING SUBSTANCES

Action # 5.3

NEPA through the National Ozone Unit will continue to execute projects with objectives to phase out the use of ozone depleting substances enabling Jamaica to fulfill its obligations under the Montreal Protocol.

2007 Report

Execution of three (3) projects continued during the year. These were the Institutional Strengthening Project, Methyl Bromide Phase-Out Project and the Terminal Phase-Out Management Plan for CFCs – UNDP Project.

2008 Report

Work has continued on the Methyl Bromide phase-out and the phase-out of Ozone Depleting Solvents and Sterilants use.

2009 Report

Work continued on the execution of the Institutional Strengthening Project, Methyl Bromide Phase-Out Project and the Terminal Phase-Out Management Plan for Chlorofluorocarbons (CFCs) – UNDP Project.

Action # 5.4

The Ministry of Health and Environment will continue to lead the process to enact the Ozone Bill.

2007 Report

The Ozone Bill was not enacted in 2007. It is anticipated that this will materialise in the 2008/9 financial year. The Act will replace the existing Ministerial Orders under the Trade Act that govern the ODS phase-out programme.

2008 Report

The review of the Ozone Bill by the Ozone Legislation Committee continued during 2007 – 2008.

It is anticipated that the final Bill will be presented to the Legislative Committee of the Cabinet by the end of 2008 and the Bill enacted before the end of the 2008 – 2009 Financial Year.

2009 Report

Work continued on the development of the Bill by the Ozone Legislation Committee during 2008/09. The Act is expected to replace the existing Ministerial Orders under the Trade Act that governs the ODS Phase Out Programme and will also include a licensing system for Technicians who serve refrigeration, air conditioning and fire-fighting systems.

A further review of the draft Bill was done in light of views expressed that several of the provisions may no longer be relevant, but elements could be retained.

Action # 5.5

NEPA will continue to provide information to the refrigeration industry and the general public on various aspects of ozone depleting substances and their alternatives

2007 Report

Public education continued through the Public Education and Corporate Communication Branch of NEPA. This involved giving presentations to schools and setting up booths at various events where information was disseminated. International Ozone Day was celebrated on September 16 through the staging of an information fair at Devon House and an outside broadcast of the event by Power 106 FM.

2008 Report

A Save Our Ozone Layer Poster Competition was held under the theme *Protect the Ozone Layer: Save Life on Earth*. Twenty seven (27) schools participated. Book vouchers and trophies were awarded to the participating schools

An information fair was held at Devon House to celebrate International Ozone Day and the 20th Anniversary of the Montreal Protocol.

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

ACTIONS FOR 2006 - 2009

Action # 6.1

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

2009 Report

The Water Resources Management Information Systems is continuously being reviewed and has been enhanced with an upgrade in the server memory to facilitate the growth in data and information generated. The speed of data access over the local area network improved from 100mps to 1000mps, with the acquisition of four (4) high speed switches, four (4) new high speed workstations for GIS modeling and mapping, three (3) laptop computers for field assignments, a large format plotter and a high resolution large format scanner to improve the quality and quantity of mapping outputs.

For this reporting period the online hydrologic database established earlier has received very high visitor traffic to the site. This is due to the availability of the various datasets now being uploaded to the site. The database is still being improved upon.

Action # 6.2

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

2009 Report

The upgrade of the national hydrologic monitoring network is ongoing. Funds allocated in the 2007/2008 Financial Year have led to the following:

- Two (2) gauging stations were re-established (Lances River at Lances Bay and Sandy River at Blue Hole)
- Major repairs were effected at one (1) gauging station (Montego River at Montego Bay)
- Ten (10) rainfall gauges were purchased and are to be installed in the Financial Year 2008-2009 to support preparation of the Water Resources Development Master Plan
- Sixteen (16) data loggers for the digital recording of stream flow data were installed across the island

The rehabilitation and upgrade of the network will continue into 2008/2009 Financial Year.

Action # 6.3

The Water Resources Authority will undertake an assessment of the impact of waste generated by five (5) rum distilleries on ground and surface waters.

2007 Report

The literature search and data review of previous work has started. Links have been established in the field with distilleries and community groups to include all stakeholders in the assessment. An assessment was completed for the Upper Morass in the Black River Hydrologic Basin and this will be further upgraded once the fieldwork is fully underway. The field work for this assessment will begin fully in the 2008/2009 financial year with completion in the 2009/2010 financial year. The late start to the fieldwork has been due to the lack of staff within the Water Quality and Environment Unit to undertake the many assignments.

2009 Report

Work on this project has been deferred to 2010. The increasing work load related to the review of development applications for environmental permits/licences, has led to the deferral of this project.

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.

2007 Report

The WRA has been collaborating with Project WET International and UNESCO in developing this programme. In March 2006 Project WET International and UNESCO signed a MOU at the Fourth World Water Forum in Mexico City to pool resources and efforts to launch a Water and Education programme across the hemisphere. Jamaica had indicated prior to the signing of the MOU that it was interested in the water education for teachers and the first workshop was held in Jamaica in 2005. In September 2006 the WRA met with project WET International and UNESCO in Miami to plan the programme for the region with Jamaica hosting the first workshop. This workshop was held June 25 and 26, 2007 in Kingston. Two (2) representatives of three (3) other Caribbean countries participated in the workshop. The representatives were a Water Specialist and an Education Specialist from the Bahamas, St. Lucia and Trinidad. In addition, senior representatives of the education and environment sector (Ministry, Teachers Colleges and NGOs) in Jamaica were participants. UNESCO and Project WET International were represented through the local office and the Regional Director respectively as well as the Project Coordinator from Mexico. The workshop reviewed a draft activity guide for use as resource material in the classroom, rated the activities, evaluated the suitability of the activities for the Caribbean and made recommendations for new activities that were more suited for the region. A draft of the first activity related to coral reefs is now being reviewed and tested in the classroom. An activity on hurricanes is now being developed. The consensus from the workshop is that there is no need to modify the curriculum in the Caribbean as water is already included. The activities were seen as a more effective, interesting and interactive mode of imparting knowledge. Once the new activity guide book is completed the Water and Education programme in Jamaica will be launched followed by similar action in other Caribbean territories.

2008 Report

WRA has been collaborating with Project WET International and UNESCO in developing this programme. Two (2) workshops were held in Jamaica in 2005 and 2007 to sensitize teachers, NGOs, and Public Sector Agencies involved in water and environmental management, on the water education programme.

The last workshop in 2007 and activities submitted via email, reviewed a draft activity guide for use as resource material in the classroom, rated the activities, evaluated the suitability of the activities for the Caribbean and made recommendations for new activities that were more suited for the region. The activity guide for the Caribbean and Latin America has now been completed and a facilitator (trainer of trainers)

workshop will be held in September 2008 where the activity guides will be distributed. The trainers will then hold workshops and work with schools and NGOs across the island to expand the programme. It is also expected that the Jamaica WET Programme will be formally launched with corporate sponsorship in September 2008.

Action # 6.5

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

2009 Report

A report on this action is not available.

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

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.

2007 Report

Discussions started regarding an appropriate legislative framework for NEPA, recognizing that there is the need for rationalization of roles and responsibilities for decision making and coordination on environmental and planning matters. The former Ministry of Local Government and Environment, in consultation with NEPA, retained the services of a consulting firm to assist in identifying issues related to the operational effectiveness of NEPA as a merged entity and to recommend the most appropriate legal and institutional framework for going forward. Drafting instructions for the selected legal and institutional approaches are to be prepared.

2008 Report

Discussions have been ongoing (through the OPM) regarding the establishment of a new Environmental Regulatory Agency (ERA).

Action # 7.2

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

2007 Report

NEPA completed Draft provisional Development Orders for the Parishes of Manchester, Trelawny and Portland and the town of Negril. Work will commence on the preparation of a St Catherine Provisional Development Order and finalization of the Kingston and St. Andrew Provisional Development Order during 2007-2008. The Development Orders are intended to provide guidance for development activities in these areas. Major development activities are slated to be implemented in these parishes and towns and therefore these Orders encourage compatible land use patterns, secure lands to satisfy future demands, enhance the historical and architectural character of the parishes, and safeguard and enhance its environmental integrity, thereby maintaining the unique features. Over the medium term, NEPA will be working to complete new Development Orders for all parishes.

2008 Report

Work started on the preparation of the Parish Development Orders for Kingston and St. Andrew, and St Catherine. These parishes are experiencing increased urbanization which has significantly affected land use pattern, the timely delivery of support services and the capacity of the Public Sector Agencies to satisfy the demand, e.g. schools, roads, water supply, sewerage, recreational facilities etc.

Development Orders for seven (7) additional parishes are expected to be completed over the next three (3) years.

Action # 7.3

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

2007 Report

NEPA completed work on the Santa Cruz Sustainable Development Plan.

2008 Report

A Development Plan for the parish of Manchester was completed.

B. LAND ADMINISTRATION

Action # 7.4

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

2009 Report

A report on this action is not available.

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.

2007 Report

Since the amendments to the Mining Regulations in August 2004, there has been an increase in the level of compliance in respect of the restoration of mined-out lands. There has been a significant increase in the areas being certified as having been satisfactorily restored – 150 hectares certified in 2003 versus 580 hectares in 2006.

2008 Report

During 2007, 577.84 hectares were presented, of this amount 513.88 hectares were certified as having been satisfactorily restored. The companies have consistently presented over 500 hectares of lands for certification over the last three (3) years.

2009 Report

During 2008, 701.32 hectares of restored lands were presented by the companies for certification. Of this amount, 677.94 hectares were accepted and certified as having been satisfactorily restored. Again, it is significant to note that since the amendments to the Regulations in 2004, the companies have consistently presented over 500 hectares of lands for certification.

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.

2009 Report

A report on this action is not available.

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.

2009 Report

A report on this action is not available.

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.

2009 Report

The vision of the LICJ is to make geospatial data, products and services available and accessible to all users to facilitate planning, sustainable use, management and development of the island's resources thereby contributing to sustainable development and economic growth. Its major mandate is to encourage the island-wide use of Geographic Information Systems (GIS) to facilitate improved and more informed decision making and planning. In its efforts to accomplish this goal, the LICJ undertook the following activities:

1. Providing access to geospatial data – The NSDI

The Office of the Prime Minister/LICJ continued to work towards the establishment of the National Spatial Data Infrastructure (NSDI). A fundamental component of a NSDI is the existence of a geospatial clearing house/portal that provides access to spatial information.

a. The National Geospatial Metadata Portal

In 2008 the **SDMD/LICJ web site and national geospatial metadata portal** were created. The metadata portal serves as the single point of contact for anyone wishing to know what geospatial data sets are available for the island. The web site and portal addresses are:

<http://www.licj.org.jm>

<http://www.licj.org.jm/geonetwork/srv/en/main.home>.

The portal currently has eighteen (18) metadata records from five (5) organizations, available to the public for viewing. The Ministry aims to have at least twenty (20) Government Agencies publishing their metadata records via the portal by 2010.

b. Metadata Creation and Management

The LICJ conducted one (1) metadata sensitization session and two (2) metadata workshops entitled **“From concept to Practise: dealing with the Backlog”** on April 29-30, and June 10-11, 2008. Some achievements included:

- Thirty eight (38) persons from twenty (20) organizations were trained in metadata creation and management as well as how to deal with backlog of datasets without metadata.
- A six (6) month action plan was developed to address the metadata issues in each organization.
- To date five (5) Agencies have submitted their action plans and are currently at the stage of implementation.
- Fifty six percent (56%) of the entities have included metadata management in their operations’ plans and thirty-eight percent (38%) have included it in the work plans.

The LICJ will monitor the progress of these Agencies to ensure full implementation of the action plans as well as to provide technical assistance where required.

2. Monthly LICJ Technical Meetings

The LICJ convened technical meetings on the fourth Thursday of each month to discuss reports and formulate approaches and strategies towards achieving its goals. The Council’s membership comprises a wide cross section of over 50 Government Agencies, Statutory Bodies, Non-Governmental Organizations and

Private Sector representatives. In 2008 the following presentations were made at Council meetings to support GIS development in member entities:

- Introducing TOPCON Positioning Systems
- Mobile and Web GIS Services
- An overview of the GPS Industry
- GIS and Disaster Management
- GIS Application Development
- GIS Mapping Traffic Accidents
- Making access to geospatial information easy: Use of GIS Mashups
- Vision 2030, Jamaica National Development Plan
- Updating the Parcel and Street Centre Line Data Sets

3. Establishment of the National Virtual Reference Station (VRS) Network

The Government of Jamaica has established a VRS Network, referred to as gFIX.net. The network is a configuration of 13 high precision GPS base stations, as shown in diagram 1 that will facilitate the collection of positioning data (X and Y coordinates). The following were achieved during the period:

- Ten (10) sites including the Network Operations Centre (NOC) have been installed and are operational
- The VRS Management Committee has been in dialogue with the Town and Country Planning Authority (TCPA), NEPA and the Department of Local Government informing them of the establishment of the VRS network and the implications of the erection of cell towers near base stations. Guidelines on the issue are being prepared to have further dialogue with the stakeholders.

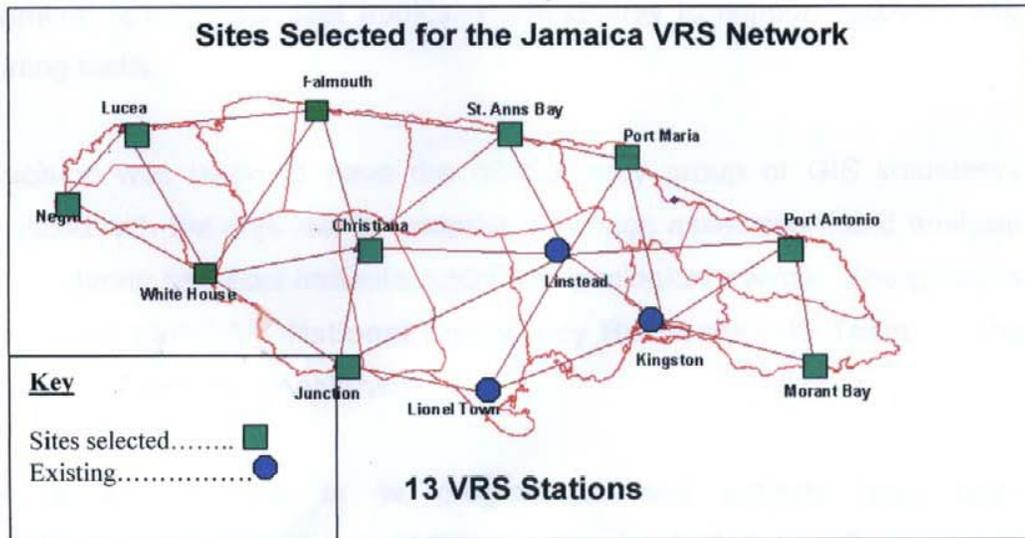


Diagram 1

4. LICJ Training and Education

The LICJ continued to provide training courses to improve the human resource competence in the use and application of GIS in the planning and decision making process of organizations.

The LICJ delivered nine (9) GIS courses for Executives, Managers and Technicians. In 2008-09, GIS training sessions were delivered to ninety-eight (98) persons from the Public and Private Sectors. Of the 98 participants, 55% (54) were males and 45% (44) females.

During the reporting period two (2) specialized courses in “**Introduction to GIS**” were delivered and one (1) new course “**Developing GIS Web Applications**” was developed and delivered.

5. Coordinated Collection of Spatial Data – Post Tropical Storm Gustav

A multi-Agency team of GIS professionals from the ODPEM, the Spatial Data Management Division (SDMD) and member organizations of the Land Information Council of Jamaica (LICJ) in September 2008 collected geo-referenced spatial data post tropical storm Gustav to support recovery and reporting tasks.

A decision was taken to have the multi-Agency group of GIS volunteers formalized with the objective of undertaking damage assessment and analysis prior to, during and post meteorological and geological events. The group is to

be called **NERGIST, National Emergency Response GIS Team**. The team is to be formally established.

The LICJ's achievements in its programmes and projects have been accomplished through the commitment, support and voluntarism of its members. The continued success of LICJ therefore requires this ongoing commitment as well as the cooperation, coordination, openness and willingness of its members to share and exchange knowledge and technical expertise.

Action # 7.9

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

2009 Report

A report on this action is not available.

Action # 7.10

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

2007 Report

The detailed soil geochemistry for Jamaica is ongoing with present emphasis on the Parishes of Trelawny, Hanover, Clarendon and St. Ann, at sampling densities in excess of 1 in 4 square kilometers. ICENS has continued to develop the national geochemical surveying and databases using state of the art techniques. These national geochemical databases are being prepared in digital form for use with imagery analysis.

Geochemical maps of the distribution of cadmium and other heavy metals are being produced and will find increasing use in a wide variety of agricultural, environmental and economic applications and studies. Geochemical data will be applied to urban and rural planning through the integration of land use plans with geochemical and geological maps.

2008 Report

Due to unforeseen circumstances, which included very inclement weather, field activities suffered major setbacks during the year and the soil sampling and mapping programme has just re-commenced in Clarendon. However, development in digital

form of national geochemical surveying and databases continued. ICENS databases now contain over 200,000 analytical data records, and over 45,000 text, maps, photographs and satellite imagery records, including one metre resolution IKONOS images for the entire island. These computer readable databases provide standard database, document, photo and multi-media content that, with GPS and GIS allow spatial assessments, interpretations and predictions, and have been used to prepare geochemical maps of the distributions of several elements including cadmium, a heavy metal of particular interest to Jamaica because of the unusually high concentrations of its occurrence in Jamaican soils and the potential threat to trade and health that this could pose for the island.

2009 Report

The broad outlines of the spatial distribution of 37 elements at a sample density of 1 in 64 km² are now available. This is being fine tuned at a density of 1 in 4 km². The data for St. Elizabeth and Manchester are completed and Clarendon, Trelawny and St. Ann are presently being worked on. This fine tuning strengthens the capacity for land use decisions in agriculture, and aids the search for potentially exploitable materials.

Action # 7.11

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

2007 Report

A Squatter Unit has been established and is implementing a programme aimed at reducing the incidences of squatting.

2009 Report

A Prevention and Containment Monitoring Regime was established. It meets quarterly and comprises all relevant stakeholder Government Ministries and Agencies, and Municipal Councils.

A stocktaking report was compiled to inform the development of a Squatting Policy. Funding is being sought to have a Squatting Policy and Implementation plan in place by 2011.

Reviews of the existing Guidelines for informal settlers and the Trespass Act of 1851 have been initiated.

An assessment of the squatting report was completed and submitted for further action.

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

ACTIONS FOR 2006 - 2009

Action # 8.1

NEPA will implement the National Biodiversity Strategy and Action Plan.

2009 Report

A number of projects are being implemented in support of the NBSAP.

**Mitigating the Threats of Invasive Alien Species (IAS) in the Insular Caribbean
NEPA/CABI**

Invasive Alien Species (IAS) are a major threat to the vulnerable marine, freshwater and terrestrial biodiversity of Caribbean islands and to the people depending on this biodiversity for their livelihoods. Caribbean states have recognised the need for a regional strategy and expressed strong interest in linking their national efforts in implementing Article 8 (h) of the Convention on Biological Diversity (CBD) to mitigate the threats of IAS in the Caribbean; they are also contracting parties to several other international instruments addressing IAS threats.

The project goal is to conserve globally important ecosystems, the species and genetic diversity within the insular Caribbean. The project objective is to mitigate the threat to local biodiversity and economy from IAS in the insular Caribbean, including terrestrial, freshwater, and marine ecosystems.

Assessment of Capacity Buliding Needs, Preparation of the Third National Report (CBD) and the Clearing House Mechanism

NEPA/UNDP

The project will:

1. Assess capacity needs in the areas of preservation of indigenous knowledge, access to genetic resources and benefit sharing.
2. Conduct initial assessment and identify monitoring programs, including taxonomy for biodiversity
3. Increase the capacity of the CHM to provide relevant data to assist in the country's development in the various sectors.
4. Sensitize the public to the CHM and its potential to assist in economic planning and hence development.
5. Complete the preparation of the Third National Report to the CBD, and Preparing the Country request for funding support in relation to the Fourth National Report.

Supporting Country Action on the CBD Programme of Work on Protected Area Systems

NEPA/UNDP

Specific objectives:

1. National-level assessment of contributions of selected categories of protected areas to the country's economy and culture as indicators of values of those categories/types of PA's
2. The economic valuation of natural resources taken into account during annual budgets, work plans and national planning processes affecting PA's
3. Appropriate methods, standards, criteria and indicators for evaluating the effectiveness of protected area management and governance are developed and adopted and related database established to collect data.

Piloting Natural Resource Valuation within Environmental Impact Assessments

NEPA/UNDP

By attaching financial and economic values to ecosystem functions, EIAs would allow for a more accurate representation of the costs associated with development. Thus, the decision-making process becomes a more holistic enterprise, one that better enables environmentally sound and sustainable development.

The objective of the project is to develop a set of natural resources valuation tools, and incorporate these into the policies and procedures governing the preparation and use of Environmental Impact Assessment (EIA).

Action # 8.2

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

2007 Report

Species surveys were conducted in 2006 -2007 for four (4) fauna groups; the American Crocodile, Game Birds, the Jamaican Iguana and Sea Turtles.

2008 Report

Orchid Abundance and Distribution Survey (Negril)

An assessment of the abundance and distribution of orchid species in Negril and its environs was completed. A report is being prepared. The aim is to develop conservation strategies for the protection of these species.

Beach Assessment for Sea Turtles

The beach at Palisadoes Port Royal was surveyed twice weekly between October 23 and November 30, 2007 and four (4) nests were recorded. Data was also collected and analyzed at Malcolm Bay/Crawford – St. Elizabeth and a final report prepared.

Bird Shooting – Post Season

Data from six hundred (600) hunters were entered into the bird shooting database for analysis and to generate the 2007 Bird Shooting Season Report.

Action # 8.3

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

2007 Report

During the year 2006-2007 NEPA prepared management/recovery plans for the plant species *Malpighia proctorii*, Game Birds and the Jamaican Boa (*Epicrates subflavus*).

2009 Report

Over the last three year a number of specially designed species assessment surveys have been undertaken to fully determine the status of, in most cases threatened and or endangered species. Additionally, management plans and recovery plans have been prepared to support and protect these species in their habitat. These assessments included; an endangered plant survey, Sea Turtle Management Activity survey, Coral Reef status, Avifaunal Assessment in Protected Areas, and Freshwater Assessment in Protected Areas. Management and Recovery Plans have been prepared for the Jamaica crocodile, the yellow snake, sea turtles and the endangered plant species *Turnera campaniflora*.

Action # 8.4

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

2007 Report

An Invasive Species Monitoring Committee has been established. A calendar and newsletter were produced highlighting the potential negative impacts of invasive species.

2008 Report

A project has been developed to examine and study the impact of ballast water (including invasive species) entering Kingston Harbour.

2009 Report

The project on the impact of ballast water entering Kingston Harbour is still ongoing.

With assistance from the GEF, Jamaica is involved in a regional project called Mitigating the Threats of Invasive Alien Species in the Insular Caribbean.

Action # 8.5

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

2007 Report

Material transfer agreements have been prepared for a number of species taken from the wild, primarily for research purposes. Seventeen (17) such agreements were approved during 2006 -2007.

2009 Report

Twenty three (23) transfer agreements were approved during 2008 -2009.

Action # 8.6

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

2007 Report

A draft National Bio-Safety Policy and drafting instructions were prepared. The documents will be submitted shortly to Cabinet and the CPC respectively.

2008 Report

The draft National Bio-Safety Policy and drafting instructions have been further reviewed. The drafting instructions are expected to be submitted for promulgation in early 2009.

2009 Report

The draft National Bio-Safety Policy and drafting instructions have been finalized and are to be submitted to Cabinet and Chief Parliamentary Counsel in 2009.

Bimonthly meetings of the National Bio-safety Committee (NBC) of the NCST were convened over the period. The work of the Committee included: development of national policy and regulations; monitoring transgenic research of papaya; public education and implementation of the National Bio-Safety Clearing House through the Natural History Division of the Institute of Jamaica.

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.

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.

2007 Report

The Programme of Work for Protected Areas under the Convention on Biological Diversity (CBD) requires that Parties adopt legal frameworks for national, regional and sub-national protected areas systems of countries where appropriate. In this regard, NEPA has developed proposed protected area regulations for several of the sites declared under the Natural Resources Conservation Authority Act (NRCA). These sites include: The Palisadoes-Port Royal Protected Area; the Portland Bight Protected Area and the Negril Environmental Protection Area.

During 2006-2007, draft papers were prepared on proposed regulations for the Palisadoes-Port Royal Protected Area; Portland Bight Protected Area and the Mason River Protected Area.

2009 Report

Draft Protected Areas Regulations are being revised for the Palisadoes-Port Royal and Portland Bight Protected Areas.

Action # 9.2**NEPA will develop and implement Protected Areas User Fee Regulations.**2007 Report

Recommendations for implementation of a user fee systems in selected Protected Areas are now being reviewed by the NRCA.

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.**2007 Report

For the reporting period, the Fisheries Division has sought assistance through The Nature Conservancy (TNC) to assist in the development of a management plan for the Pedro Cays. A socio-economic study (the first of its kind for the Cays) was completed through a Consultant hired by TNC which has since been reviewed by the Division.

NEPA completed a Pre-Declaration Assessment of the Canoe Valley area which included a socio-economic survey, terrestrial, aquatic, marine and wetland assessments. The Pre-Declaration Resource Assessment Report is expected to be completed during the first quarter of 2007-2008.

2008 Report

The Canoe Valley Pre-Declaration Assessment was conducted from July 2006 to April 2007 and included socio-economic, ecological (marine, terrestrial, wetland, bat-cave systems and aquatic systems), archaeological/cultural and water quality components.

The assessments involved collaboration with the Jamaica National Heritage Trust (JNHT), Birdlife Jamaica, Jamaica Constabulary Force (JCF) and the University of the West Indies (UWI) Sub-Aqua Club. Three (3) community meetings were held from April 23-25, 2007 in Morley Hill, Rest and Alligator Pond in the parishes of Clarendon and Manchester.

2009 Report

The Forestry Department has established four (4) additional Local Forest Management Community groups. These are stakeholder groups mandated under the Forest Act, 1996 to assist the Forestry Department in the management and “monitoring of the

condition of natural resources in the relevant forest reserves, forest management areas or protected areas”. Three (3) of these are in the Cockpit Country and one (1) in the Dolphin Head forest reserve. Two (2) draft Local Forest Management Plans have been prepared – one for the Cockpit Country and the other for the Bull Head Forest Reserve. These plans are currently being revised/reformatted before implementation.

Action # 9.4

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

2007 Report

As is required under the co-management agreements, operational audits of the Jamaica Conservation Development Trust (JCDDT), Negril Coral Reef Preservation Society (NCRPS) and Montego Bay Marine Park Trust (MBMPT) were conducted and the corresponding Monitoring/Operational Audit Reports were completed and presented to the NRCA.

2008 Report

Operational audits of the Jamaica Conservation Development Trust (JCDDT), the Negril Coral Reef Preservation Society and Montego Bay Marine Park Trust were conducted. A final report for each audit has been prepared.

2009 Report

An operational audit of the Jamaica Conservation Development Trust (JCDDT) was conducted and a final report prepared.

Action # 9.5

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

2007 Report

Jamaica has two (2) Wetlands of International Importance, namely the Black River Lower Morass and Palisadoes-Port Royal. No new area was designated during the period.

World Wetlands Day (WWD) is celebrated annually on February 2nd and was commemorated. It marks the anniversary of the adoption of the Convention of Wetlands signed in Ramsar, Iran on February 2, 1971. In October 1997, Jamaica

became the 104th Party to the Convention on Wetlands of International Importance, also called the Ramsar Convention.

The day was celebrated under the theme, “Wetlands, Sustaining Life & Livelihoods”. The National Environment and Planning Agency (NEPA), in collaboration with the National Ramsar Committee organized activities to mark this important event, including a tour of the UWI Marine Laboratory and the mangroves in the Palisadoes - Port Royal Ramsar Site.

Other activities included displays mounted at the Kingston and St. Andrew Parish Library and the Institute of Jamaica between January 30 and February 3 and the distribution of posters to libraries island-wide.

2008 Report

For the Ramsar Day celebrations, national attention was focused on the Black River Lower Morass in St. Elizabeth, to mark the tenth anniversary of the listing of the Black River as a Wetland of International Importance by the Ramsar Convention.

NEPA hosted a Wetlands Day Educational Boat Tour of the Morass for students and teachers from schools in the area. In the afternoon, NEPA conducted a sensitisation Workshop which afforded fisher folk and other key stakeholders an opportunity to air their concerns about the management of the Morass. Information garnered from the workshop will feed into the national plan for wetlands management in Jamaica.

Action # 9.6

Public education material on Protected Areas will be developed.

2007 Report

The National Environment and Planning Agency (NEPA) partnered with RARE (a U.S based NGO) and the Nature Conservancy (TNC) to implement a conservation campaign project designed to strengthen the capacity of the Port Royal Protected Area to conserve the areas natural resources. The resources in the Palisadoes-Port Royal Protected Area include wetlands, coral reefs, seagrass beds, cays, and dunes. Financial support was also provided by the NRCA for a number of activities, such as the employment of rangers, beach/mangrove clean-up, conducting research, as well as refurbishing and installation of signs and bollards.

The conservation campaign will, among other things:

- equip the Port Royal community to better manage the area’s natural resources
- give the community a “voice” in conserving their natural resources; and
- help individuals within the community to improve their standard of living through the pursuit of sustainable livelihoods.

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

ACTIONS FOR 2006 - 2009

Action # 10.1

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

2009 Report

The Forestry Department has been actively implementing the National Forest Management and Conservation Plan (NFMCP) following the implementation Strategies outlined therein:

Strategy 1: Community participation - Since 2001, seven (7) Local Forest Management Committees have been created and are actively working with the Department.

Strategy 2: Public Education - A Public Awareness Unit was created within the Forestry Department and has been actively providing valuable environmental educational material to schools, especially in the rural communities surrounding the forested areas of Jamaica.

Strategy 3: Forest Research - The Forestry Department has been working with JAMALCo through a MOU to develop through the Forestry Department's Research Unit, suitable forest cover for mined out areas which are to be reclaimed.

Strategy 5: Local Forest Management Plans - The Forestry Department currently has two (2) active co-management agreements with other Agencies. One (1) with the National Water Commission to co-manage its lands in the hills of St. Andrew and one (1) or another which was renewed in 2008 with the JCDDT to manage the Blue and John Crow Mountains.

Strategy 6: Forest Protection - The Forest Department has completed bio-physical inventories in five (5) of the nine (9) Watershed Management Units targeted in the NFMCP. A *National Forest Inventory Report, 2003* was produced from this exercise and the data is being used to inform the preparation of the Local Forest Management Plans.

Through an incentive programme, the Forestry Department has declared two (2) privately owned properties, one (1) Forest Reserve and one (1) Forest Management Area in an effort to protect forested areas outside its jurisdiction.

Strategy 7: Forest Production Programme - Reforestation has been in the order of 250 ha/year with approximately 100 ha on public lands and 150 ha/yr on private lands. The planting on private lands has been accomplished through a Private Tree Planting Programme Initiative instituted by the FD. This initiative involves free seedlings and technical assistance to private land owners. The Department has also been working with JAMALCo to reforest some of the mined-out bauxite areas.

Strategy 8: Investment and Incentives - Incentives such as the remission of property tax and the provision of free seedling are being used by the FD to encourage private land owners to either retain lands that are in forests or reforest/afforest areas not currently in forests. The FD is also actively involved in the management of the Forest Conservation Fund, a debt swap arrangement between the GOJ, TNC and the US Government. This fund provides support to NGO's who wish to undertake forest conservation projects.

Action # 10.2

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

2009 Report

The Forestry Department is putting in place a more efficient and effective system of patrolling and policing all products being removed from the forest. A Legal and Enforcement Division has been established and Enforcement Officers will be actively engaged in the field in 2009.

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.

2009 Report

The Forestry Department is being transformed into a performance-based institution in the form of an Executive Agency. Therefore the organizational structure has been modernized to make it more efficient and effective in its service delivery.

Action # 10.4

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

2009 Report

Incentives such as the remission of property tax and the provision of free seedlings are being used by the FD to encourage private stakeholders to either retain their lands in forest cover or reforest/afforest areas not currently forested.

The Integrated Watersheds and Coastal Area Management (IWCAM) Project (started in October 2006) being implemented in the Drivers River Watershed in Portland, is still ongoing and aims to use incentives as a strategy to support sustainable watershed practices.

Lessons learnt will be applied nationally.

Action # 10.5

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

2007 Report

A Strategic Action Plan (SAP) for Environmental Management of the Rio Cobre Watershed that covers the five-year period April 2008 – March 2013 was prepared. This SAP when implemented will ensure the proper management and by extension, the sustainability of this watershed. The Action Plan is built around a framework that links specific actions to strategic objectives and watershed management goals. The management goals of this plan encompass the three (3) conceptual pillars of the

integrated watershed management paradigm; environmental protection, sustainable economic development, and stakeholder participation, and includes:

1. Improved water quality and environmental conditions.
2. Improved economic returns from sustainable natural resource use.
3. Active involvement of communities, Government Agencies, and the Private Sector in watershed management.

It is hoped that this SAP would be the model to be adapted to other WMUs, and lessons learnt would be transferred.

Action # 10.6

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

2009 Report

Since 2007 the Forestry Department has been producing an average of 250,000 seedlings per year.

Action # 10.7

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

2009 Report

The Forestry Department is putting in place a data collection system to assist in this review.

Action # 10.8

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

2009 Report

The Forestry Department planted 102.7 ha and 69.7 ha on public lands during the financial years 2007/2008 and 2008/2009, respectively.

Action # 10.9

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

2009 Report

The Forestry Department estimated that 165.6 ha and 116.9 ha was planted on private lands during the financial years 2007/2008 and 2008/2009, respectively. This estimate was arrived at from the number of seedlings distributed through the Private Tree Planting Programme.

Action # 10.10

The Forestry Department will declare additional Forest Reserves.

2009 Report

No action has been taken in this regard because the Forestry Department is in the process of accurately mapping and assessing all the Forest Reserves and Crown Lands under its management. After this is completed a comprehensive list of recommended areas to be declared Forest Reserves will be presented.

Action # 10.11

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

2009 Report

A report on this action is not available.

Action # 10.12

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

2009 Report

In November 2005, the Jamaica Tree Growers Association was incorporated as a non-profit company limited by guarantee, with three (3) founding Directors and a Company Secretary.

Action # 10.13

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

2009 Report

The Conservator of Forests is a permanent member of the Oversight Committee of the Forest Conservation Fund and is the current Chair.

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 Licences 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

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.

2007 Report

NEPA, in collaboration with the Jamaica Coral Reef Monitoring Network (JCRMN) has established a framework for monitoring. Data on live coral cover is being collected at a number of sites across the island. The Reef Check and Atlantic Gulf Rapid Reef Assessment (AGRRA) methodologies are used in the monitoring and data collection exercises.

2008 Report

Routine coral reef data is now collected from just over fifty-three (53) sites across the island. Regrettably, there are a number of gaps in the data collected with some sites having no information for several years. Every effort is being made to ensure that routine yearly monitoring is conducted at each site so that a comprehensive database of coral reef information is maintained.

2009 Report

NEPA, in collaboration with the Jamaica Coral Reef Monitoring Network (JCRMN) has established a framework for monitoring. Data on live-coral cover is being collected at a number of sites across the island. The Reef Check and Atlantic Gulf Rapid Reef Assessment (AGRRA) methodologies are used in the monitoring and data collection exercises.

Action # 11.2

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

2007 Report

Work has started on the development of a comprehensive ecosystem database. Data is currently available on water quality, coral reef health, wetland quality, population, coastal erosion sites, etc.

2008 Report

Coastal spatial data has been incorporated into a new enterprise GIS system. This information will soon be available via NEPA's website. Information will also be available as part of a Caribbean-wide marine coastal atlas project.

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.

2007 Report

The National Oceans and Coastal Zone Policy is administered by the Ministry of Foreign Affairs and Foreign Trade through the work of the Council on Oceans and Coastal Zone Management. Significant achievements that have been facilitated by the Council over the reporting period include; the establishment of a permanent structure on the South West Rock, Heads of Agreement between China and Jamaica regarding research in ocean management, and delimitation discussion between Jamaica and its Caribbean neighbours.

2009 Report

The Council continued work on the establishment of ocean observatories at selected sites around the island, the management framework for the Islands Cays and support to the development of legislation including the Clean Sea Bill and diving regulations.

Action # 11.4

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

2007 Report

For the reporting period, the Division, through a consultancy did a synthesis of several draft working papers including a Social study, an Economic Study, and a Macro-Economic Study to form a comprehensive Draft National Fisheries Policy. This is currently being reviewed in-house by the Fisheries Division.

2008 Report

The draft policy was completed and is now being discussed at public presentations.

2009 Report

The Fisheries Division in November 2008 completed its final set of national public consultations in Kingston and St. Andrew, St. Mary, St. James and St. Elizabeth. There was a general endorsement of the document and the recommendations made were submitted, reviewed, and incorporated into the final document. A review of the proposed management strategies for marine, aquaculture and inland fisheries was done and these are being collated and incorporated in the final draft. The final draft was submitted to the head office of the Ministry of Agriculture and Fisheries for review.

Action # 11.5

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

2009 Report

A report on this action is not available.

Action # 11.6

NEPA will review the National Lifeguard Examination and Certification Programme with a view to broadening the technical capacity of Lifeguards to include environmental awareness.

2007 Report

NEPA developed a Procedures Manual, designed as a field guide to Officers processing lifeguard licences during national lifeguard examinations. The Manual focuses on the organizational and administrative aspects crucial to the examination and presents an outline of recommended procedures. It includes procedures for preparing an upcoming examination, such as documentation (application forms,

control sheets etc), newspaper ads, request for funds; and operational procedures that must be adhered to during the national examination.

Amendments were also made to the Safety Measures Regulations of the 2006 Beach Control Act. Under the new regulations, owners of beaches or licensed areas are required to employ the number of licensed Lifeguards as specified by NEPA, ensure that the areas are adequately manned at all times by a Lifeguard and provide Lifeguards with clearly marked uniforms.

The Beach Control (Safety Measures) Regulations, 2006 also requires beach licencees to keep all life saving devices in good condition, ensure that all life saving devices are readily available for use by the Lifeguards, and allow NEPA officials to inspect such devices upon request.

Action # 11.7

MH & 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.

2007 Report

The draft Policy is currently being revised by the MLGE to take into account concerns expressed by stakeholders, including the effects of large coastal developments and over water rooms.

It is anticipated that the revision to the draft Policy will be completed and the document circulated for comments by the end of the 3rd quarter of the 2007/8 financial year.

2009 Report

A section on beach access has been prepared and is being reviewed. It is proposed that other sections of the draft concerning coastal resources be included in the Coastal Policy.

Action # 11.8

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

2007 Report

All categories of beaches across the island are being inspected and Global Positioning System (GPS) data collected and inputted to an existing dataset to aid the spatial analysis of beaches.

The tenure of the Salem Public Beach in St. Ann was secured by the St. Ann Parish Council and rehabilitation to the structures on the beach completed.

Action # 11.9

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

2009 Report

The Jamaica Coral Reef Action Plan has been reviewed.

Action # 11.10

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

2007 Report

The Division has begun preparations guided by the Cabinet Office through its Public Sector Reform Unit. Several consultancies have been done resulting in the development of a Modernization Plan, a Medium Term Financing Plan and a Fisheries Strategic Review. These were reviewed and the proposed implementation of a “Fisheries Agency” by April 2008 will be preceded by a transitory phase where the structure of the Agency will be developed under the auspices of a senior management team led by a CEO who will be appointed.

2008 Report

A CEO has been appointed for the new Agency.

Action # 11.11

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

2007 Report

The Fisheries Division was instrumental in the co-development (with the Caribbean Maritime Institute, *et al*) of a project submitted to the IDB for funding to ascertain the potential development of a diamond-back squid fishery in Jamaica.

The project entailed key components including the development of a Marine Chart; conducting experimental fishing; as well as training in areas such as sanitation, fishing and safety at sea. The main target beneficiary is small scale fishers. The management and regulation of the fishery will be a high priority of the Fisheries Division should any empirical study find the fishery to be commercially viable.

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.

2007 Report

For the reporting period, the Fisheries Division began a pilot project in Bowden, St. Thomas at the Mariculture Research station where 9 lobster condominiums (artificial shelters) were deployed. There has been significant success to date in terms of aggregation of juvenile lobsters in the artificial shelters. Data collection is currently being maintained at the site. The Division made contact through the Caribbean and Americas Department of the Ministry of Foreign Affairs under a Jamaica-Cuba Bilateral Technical Cooperation Programme to seek technical expertise from Cuba to assist the Division in developing lobster casita technology. The expert visited the country and worked with the Division in developing the technology in March 2007. Jamaica still maintains a bilateral agreement with Mexico in this field and hopes to continue this collaboration.

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.

2009 Report

Discussions are ongoing regarding a MOU between NEPA and the UWI in the area of research collaboration.

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

ACTIONS FOR 2006 - 2009

Action # 12.1

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

2007 Report

RADA through the training of extension Officers was able to provide advisory services to the farming community and the general public. These services addressed and covered topics such as plant health, food safety, and pest management. RADA collaborated with several organizations and Agencies in implementing the various field aspects of farmer and staff training, pest surveillance and assessments. A significant number of extension personnel were trained in pest identification and Integrated Pest Management (IPM). These sessions which encouraged the use of an integrated crop/pest management system were facilitated mostly through field visits, and farmer training with the emphasis on IPM and technology transfer through the on-farm demonstrations.

Four Hundred and Fifty Six (456) formal and One Thousand, Three Hundred and Seventy (3,370) informal farmer training sessions in Integrated Pest Management (IPM), pesticide management and food safety were conducted by extension Officers island-wide.

Nine (9) validation and six (6) demonstration plots were established island-wide to demonstrate various methods of crop protection and their impact on crop production. Special emphasis was put on the management of anthracnose disease of sweet yam in the parishes of St. Ann, Clarendon, Manchester and Trelawny, and control of West Indian Fruit Fly on mango using baited traps instead of regular application of toxic and costly insecticides.

2009 Report

In order to meet global trade requirements through improved phytosanitary and food safety standards in the field and to promote health and environmental well-being through improved management of the agro-ecosystem and agricultural pesticides in the field, RADA continued to carry out the pest and pesticide surveillance. Nine (9) staff training sessions were held under this programme. All Parish Management and Plant Health personnel were trained in pest identification, and integrated pest and crop management. All extension staff underwent a training course on pest identification. Nineteen Thousand, Four Hundred and Forty Nine (19,449) pest and Twenty Nine Thousand, Two Hundred and Ninety Eight (29,298) pesticide observations were done. Through delivery of farmer training sessions, Thirteen Thousand, One Hundred and Ninety Seven (13,197) farmers were trained in the areas of safe and effective use of pesticides and IPM.

In keeping with the Ministry of Agriculture's focus on technology transfer, RADA continued field validations and established demonstration plots to determine the effectiveness of strategies and demonstrate effective methods of crop protection. Six (6) validation and demonstration plots were established island-wide to demonstrate various methods of crop protection to farmers. These included management of sweet yam anthracnose disease and diseases affecting yellow yam and treatment of ginger planting material for the control of ginger rhizome rot disease, and the control of banana borer with use of pheromone traps.

Staff training sessions were conducted in Portland and St. Andrew on the pink hibiscus mealybug.

Action # 12.2

RADA will implement a national Pest Management Plan to protect local agriculture from recently introduced exotic pests.

2009 Report

RADA in collaboration with other stakeholders successfully managed outbreaks of two (2) pests of major economical importance; the Pink Mealybug and the Red Palm Mite. Early detection of pests and use of biological control approach greatly reduced economical losses and provided sustainable pest management without the use of toxic pesticides. Use of such an approach significantly impacted on public awareness about biological control, preservation of natural enemies and biodiversity.

Nine (9) staff training sessions were held under this programme. All Parish Management and Plant Health personnel were trained in pest identification, integrated pest and crop management. All extension staff underwent a training course on *Pest Identification*. Staff training sessions were conducted in Portland and St. Andrew on the pink hibiscus mealybug.

Six (6) validation plots were established during the year on the management of five (5) pest problems; two (2) plots were established in Clarendon for ginger rhizome rot and yam anthracnose disease, two (2) plots were established to validate the use of a sex pheromone for the banana weevil borer *Cosmopolites surdidus*, one plot was established for mass trapping of West Indian fruit fly *Anastrepha oblique*, in mango and one (1) plot for erineum mite on hibiscus.

One Hundred and Ninety Five (195) formal and Six Hundred and Three (603) informal farmer training sessions were conducted by extension Officers island-wide and Ten Thousand, Three Hundred and Seventy (10,370) farmers were trained. A number of householders were also trained on recognition and management of the pink hibiscus mealybug.

RADA spearheaded implementation of an international, collaborative project for the West Indian Fruit Fly Surveillance, which aimed at the creation of a regional data base and provided critical information (of economical importance) on the species, their population and distribution. Data generated can greatly assist farmers in proper timing of control measures and reduce use of toxic pesticides.

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

2008 Report

RADA operates a soil management programme function which seeks to support sustainable agricultural production particularly in watershed and other vulnerable areas where inappropriate production practices often lead to accelerated soil erosion, flooding and slippages, associated groundwater contamination, coastal degradation and costly infrastructural damage. The programme interventions were restricted by budgetary constraints; meaningful exercises were nevertheless carried out in certain critical areas.

RADA facilitated the reinforcement of some best practices and technologies across the island. The technologies that were passed on to farmers and agricultural practitioners re-energized and motivated them to carry out these practices on their own. These exercises took the form of theoretical and practical training sessions which sensitized farmers about the economic and environmental importance of soil fertility preservation, slope management, environmental pollution from agricultural activities, and the functional relationship between land degradation and declining farm productivity. The sensitizing programme was supported by various types of on-farm

demonstrations which highlighted relatively inexpensive but nonetheless effective soil treatments as mitigation measures. RADA managed to continue the inter-Agency collaboration with the National Environment and Planning Agency, MOAL, the Forestry Department and IICA.

2009 Report

Inter-Agency collaboration, farm visits, meetings and displays were conducted by RADA with the aim of sensitizing farmers and rural communities on the importance of treatments such as contour barriers, grassed waterways, check dams, tree orchards, intercropping and minimum tillage on soil conservation. Significant strides have been made in these areas to date.

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.

2009 Report

A report on this action is not available.

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.

2008 Report

RADA has set up a greenhouse unit that is fully staffed and functional and it is presenting and encouraging the use and adoption of greenhouse and protected agricultural technology by farmers and potential entrants into the agricultural sector. RADA through its own efforts has set out and established two (2) model greenhouses for farmers to have access in order to be familiar with the technology.

2009 Report

All extension personnel along with selected farmers have been trained and exposed to greenhouse technology methods and applications. This has been done both locally and abroad through the assistance of several international Agencies.

Areas and farmers across the country have been selected to participate in a CIDA funded greenhouse development programme. Additionally, commitments have been

given for the setting up of a special greenhouse to be used for the specific purpose of research and development of greenhouse technology.

Actions # 7.9 and 7.11 are no longer the responsibility of the Ministry of Agriculture and Fisheries since the Land Portfolio was transferred to the Office of the Prime Minister (OPM).

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.

2007 Report

Data collection for the 2007 Census of Agriculture began on February 2007 in selected areas of all parishes with the exception of Kingston. It is anticipated that interviewers will collect information from over 150,000 farmers. A report presenting preliminary information for the census is scheduled for publication by March 2008.

2009 Report

A report (Census of Agriculture 2007 Preliminary Report) was published in November 2008. A second report will be published by the end of 2009.

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	MOT
Number of registered sites, districts, monuments and structures	MOT
Number of World Heritage Sites	MOT
Number of beaches using Blue Flag Certification	NEPA

ACTIONS FOR 1999 - 2002

Action # 13.1

The Ministry of Tourism 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.

2009 Report

The Ministry of Tourism is currently developing a framework to engage communities in defining their roles in the development of their community-based tourism products and the improvement of the quality of life in their community. This is being done through the implementation of the community-based tourism project which has been ongoing since 2006.

The Ministry is also implementing strategies to develop Jamaica's heritage assets: built, natural, cultural and historic, into ecotourism and heritage tourism products. This is being done through regular collaborations with Government Agencies as well as community-based organizations. One such strategy is the Cockpit Country Ecotourism/Adventure Tourism Strategy.

Action # 13.2

The Ministry of Tourism 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.

2009 Report

The Ministry of Tourism is currently not developing rewards and incentives but is encouraging tourism entities to adopt Environmental Management Systems. The Ministry is also infusing the concept of environmental stewardship in regulations for environmental compliance. A number of awards have been developed over the years. The Tourism Achievement Awards have been awarded to a number of environmentally friendly entities and operators under an environmental theme. The Tourism Services Excellence Awards also has an environmental component which recognizes entities and operators who display sound environmental practices.

Action # 13.3

The Ministry of Tourism will develop a Policy to streamline and integrate the management of motorized and non-motorized water-based leisure sport in marine recreational areas.

2009 Report

The Ministry of Tourism is in the process of developing a policy to streamline and integrate the management of motorized and non-motorized water sports in marine recreational areas. The Ministry is currently in consultations with key stakeholders in reviewing the Final Report of the Water Sports Study. To date, the Ministry has completed the Carrying Capacity Analysis, the Safety Requirements as well as the Legal Issues governing water sports. This process is currently ongoing with weekly stakeholders' committee meetings to review the Final Study and make recommendations to inform the policy.

Action # 13.4

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

2009 Report

Since 2006, the Ministry of Tourism has partnered with the Association of Caribbean States (ACS) to embark on a project to develop and implement sustainability indicators for the Greater Caribbean. The Sustainable Indicators Project created a quantification system for assessing the inclusion levels of tourism destinations into a Sustainable Tourism Zone for the Caribbean (STCZ). The project looked at Ocho Rios and Port Antonio as the two (2) pilot sites for Jamaica. The sustainability indicators were drawn from a wide range of sources including, Agenda 21 and other stakeholders. These indicators were divided into three (3) dimensions of sustainability including natural and cultural heritage; economic, and social and ethical dimensions. This project is currently ongoing.

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	MEMT
Number of use of alternative energy technology	MEMT
The number of cogeneration facilities	MEMT
Amount of tax concession on alternative energy technology	MEMT
The number of demand side management programmes	MEMT

ACTIONS FOR 2006 - 2009

Action 14.1

The Ministry of Energy, Mining and Telecommunications (MEMT) will implement the new Energy Sector Policy.

2007 Report

In February 2006, the Energy Policy Green Paper, which covers the period 2006-2020 was promulgated and subsequently presented to the House of Parliament. The Green Paper provides an overview of the 1995 Energy Policy and addresses ten (10) major elements of the policy with each element consisting of a subsection that outlines the policy issues and recommendations to be addressed. The development of renewable energies is one of the ten (10) subsections outlined in the policy document. The Green Paper is posted on the Ministry's website and persons are invited to submit their comments in writing to the Ministry.

Although, the Green Paper has been presented to stakeholders and energy technocrats at meetings, seminars, conferences and workshops island-wide, consultations have not yet commenced. It is anticipated that public consultations will begin in earnest in the coming months.

2009 Report

The public consultations on the green paper have been completed.

Action 14.2

The Ministry of Energy, Mining and Telecommunications (MEMT) will facilitate the development of all new and renewable energy sources, especially hydro-power, biomass, solar and wind energy.

2007 Report

The Ministry is committed to facilitating development of energy resources in any possible way that it can. To show its commitment, the Government has included in the Energy Policy Green Paper a policy recommendation, which outlines targets for renewable energy. Renewable energy, which currently contributes about 7% to the national grid is targeted to contribute 10% to the national grid by 2010 and 15% by 2020.

Investment opportunities exist in renewable energy and discussions are ongoing with potential investors to highlight areas ripe for investment. Currently there are 8 mini hydropower plants in Jamaica. The total generating capacity is approximately 23 MW. From proposed projects, the total generating capacity is estimated at 90 MW.

Action 14.3

The Ministry of Energy, Mining and Telecommunications (MEMT) will establish a central Energy Conservation and Renewable Unit which will act as a facilitator for all new and renewable energy projects.

2007 Report

The PCJ is the Agency of the Ministry of Energy Mining and Telecommunications with responsibility for development of the petroleum and renewable energy resources in Jamaica and for the overall management of the country's energy sector.

The PCJ created the Energy Efficiency Unit (EEU) in 2004 to intensify the thrust towards increasing energy efficiency and conservation at the domestic, commercial and industrial levels. The Unit has realized significant achievements under its "Use Less Pay Less" public education campaign and through the implementation of specific Public Sector projects, jointly financed by the GOJ/UNDP Public Sector Energy Efficiency Programme. These projects include energy audits, preventative maintenance programmes, photovoltaic lighting, solar water heating, lighting efficiency improvement, power factor correction and training in twenty-six (26) public hospitals and eight (8) educational institutions.

In November 2006, the Centre of Excellence for Renewable Energy (CERE) was established as a division within the PCJ. CERE aims to ensure that Jamaica will

regularly implement new ideas and methods in renewable energy, in recognition of Jamaica's abundant supply of natural resources. The Centre will diversify Jamaica's energy base by encouraging a selection of indigenous energy options.

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. (MEMT)

2007 Report

The Office of the Utilities Regulation (OUR) in its regulatory policy for the electricity sector, established (in June 2006), guidelines for the addition of generating capacity to the Public Electricity Supply System. These guidelines can be found on the OUR's website.

Action 14.5

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

2007 Report

Demand Side Management Programmes were established prior to 2006, however, some of these activities have shifted to the Ministry and the Petroleum Corporation of Jamaica. The Ministry is currently implementing measures that will strengthen these programmes going forward.

2009 Report

A report on this action is not available.

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

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 (now the Department of Local Government) will complete and implement the National Hazard Risk Reduction Policy.

2009 Report

The first draft Strategy and Action Plan which is the follow-up document to the hazard mitigation policy has been prepared and is in effect until further changes are made.

Action # 15.2

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

2009 Report

A report on this action is not available.

Action # 15.3**The ODPEM will undertake a vulnerability assessment of the Agricultural and Tourism Sectors.**2007 Report*Agricultural Sector*

The process of mainstreaming Disaster Risk Management in all areas of national development was furthered with the continued development of a mitigation plan for the agricultural sector. A meeting of the major stakeholder's in the Ministry of Agriculture and RADA was held to seek consensus and partnership on the need to make interventions regarding preparedness and mitigation in the sector. The Ministry pledged its support to the process against the background of:

- The need for greater food security
- Loss of agricultural lands to natural hazards
- Damage incurred within the sector after major events

Preliminary work in the sector examining institutional preparedness suggested a need for a preparedness plan to bolster preparedness of the sector at the national level as well as at the sub-sector level. Work will continue to realize the implementation of these critical activities.

Tourism Sector

The ODPEM and the Ministry of Tourism are involved in a project toward this end with the aim of developing mitigation plans for the sector.

2008 Report

Mainstreaming of Disaster Risk Management (DRM) within the tourism and agricultural sectors, and initiatives towards making Jamaica a more resilient nation will have a broad focus.

The initiatives have been across the tourism and agricultural sectors.

Tourism Sector

- Tourism Emergency Operations Centre established and introduced at the parish level.
- National Project Implementation Committee (NPIC) for the Regional Public Good (RPG) Project convened its first meeting on April 16, 2008. The project was presented to a range of stakeholders including representatives.
- The RPG project embarked on developing a regional strategy and standards for mapping Tourism facilities vulnerable to hazards. A National Workshop was held to review the outputs of the project.
- CDERA/IDB/UWI – Disaster Risk Management for sustainable tourism management, Baseline Report Project.
- A meeting was held in an effort to mainstream disaster risk management in the tourism sector. The overarching areas of focus include disaster preparedness, emergency response planning and disaster recovery. These activities will be streamlined through the Corporate Plan for the Ministry and the Strategic Plan for the ODPEM.
- DRM has developed into a key strategic objective for the Ministry of Tourism and is fully articulated in the Ministry’s Multi-Hazard Contingency Programme.

Agricultural Sector

- Regular meetings of the Agricultural Disaster Risk Management (ASDRM) wider sub committee and working group were held.
- FAO approved funding support for the hiring of a Consultant to prepare a preparedness and response plan for the agricultural sector.
- Through the Agriculture Disaster Risk Management Committee, public education was improved through preparation and dissemination of agriculture sub-sector specific brochures.
- Drafting of preparedness guidelines for parish offices.
- ODPEM participated in a livelihood assessments training conducted for the agricultural sector.

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

Subdivisions

The organization contributes to the mainstreaming of Disaster Risk Management into development planning by making recommendations for developments particularly those proposed to be located within high-risk locations. Over the period, the ODPEM has received a total of 111 subdivisions and has responded to fifty nine (59) of them. Work is currently underway to complete the remaining assessments.

Environmental Impact Assessments

Five (5) Environmental Impact Assessments were received and comments provided to the National Environment and Planning Agency over the period.

Hazardous Material Applications

Over the period, the ODPEM has submitted comments to NEPA on an environmental permit concerning one (1) hazardous material facility – Island Lubricants regarding the installation of above ground storage tanks.

Definition of High Risk Areas

The ODPEM has revised the definition of high-risk areas. This is to support the vulnerability ranking methodology also prepared by the Division. There is currently an effort to streamline the ODPEM list of high risk areas and the SDC list of communities. The database of high-risk areas/communities is being validated against the ODPEM definition of a high-risk area. This being carried out at the parish level through the Parish Disaster Coordinators.

2008 Report

The process towards developing a Comprehensive National Hazard and Vulnerability Risk Mapping Programme has started with an initial meeting of the technical Agencies that prepare hazard maps. The mapping programmes of the technical Agencies were highlighted, and areas for further support and strengthening were discussed.

The ODPEM is represented on the Technical Review Committees at the KSA and NEPA. A policy and concept note has been developed to inform the designation of special vulnerable areas. Research was conducted including hazard information for inclusion in the development orders for St. James and St. Catherine.

Action # 15.5

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

2007 Report

The Geographic Information System (GIS) development has progressed smoothly and has been integrated into the disaster management process. GIS is used in national emergency operation centre (NEOC) operations and through the work programmes of the organization. The ODPEM has been in the process of building its database. To this end the organization has received data from various critical Agencies. The national shelter database developed by the ODPEM has also been developed.

2008 Report

The technology has been utilized by the organization to aid in its disaster management process including planning and mitigation activities particularly in the areas of vulnerability and damage assessment. Through the spatial representation of critical facilities and the overlapping of various elements of the database, the decision support system for preparedness and response has been significantly enhanced.

Integrating GIS in ODPEM has been an ongoing exercise. During the period, the GIS was used to produce maps to be included in incident reports, damage assessment reports and subdivision processing. The organization made a submission to the Cabinet Office for the establishment of a four-member GIS unit. However, that has not yet materialized. During the period 2005 to 2007 the ODPEM utilized the service of a CUSO volunteer to help in the development of the ODPEM GIS Programme. The CUSO representative has completed his volunteer period and the organization is again without a dedicated body in that area, which will result in a setback to the organization's GIS development programme. However, particular focus is being placed on scenario development and modeling to better guide decision making for disaster impacts (pre, during and post).

GIS has aided in the management of the EOC from the mapping of impact areas to scenario development. This has enhanced the function of the EOC and has also pushed the ODPEM forward in integrating technology to aid decisions. During the period in review the country was impacted by Hurricane Dean. Scenarios were generated using historical data from three (3) past events. The scenarios aided decision making for evacuation of coastal towns and low lying vulnerable areas.

During an event, ArcGIS version 8.3 was used to provide updated database and spatial representation of incidents from communities that were affected across the island. A customized ARcGIS application which was designed as a simpler interface to locate

communities, map reported incidents and shelters along with their associated attribute database information was used during an event.

2009 Report

A Geographic Information System (GIS) is being used as a platform for Disaster Risk Management decisions. In strengthening national emergency response capabilities, ERDAS and remote sensing software was added to the GIS software currently being used. Situational mapping was done to enhance decision making in the EOC during Tropical Storm Gustav response. This was also supported by scenario mapping and planning.

GIS professionals were used to map damage which resulted from Tropical Storm Gustav, and from this group, the National Emergency Response Geographic Information Team (NERGIST) was developed. This initiative will be coordinated through the Land Information Council. A Cabinet submission has been prepared to support this national post impact mapping and the development of a national mapping team. To date approximately 25 GIS professionals have been trained in the Initial Damage Assessment methodology to provide mapping support to initial post impact assessments.

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.

2007 Report

The ODPEM has developed a methodology for ranking vulnerable communities for floods, landslides, drought, earthquakes and storm surges. The indices used include dependency ratio, housing type, population density, damage magnitude, hazard frequency, hazard impact area, and poverty index. Scores are assigned to each index and the vulnerability rating is calculated by the summing of the scores assigned to each index.

2008 Report

A vulnerability assessment methodology has been developed to rank the vulnerable communities in Jamaica. Research and Testing as outlined in the methodology was carried out and is completed.

Training has been conducted in community hazard mapping in several communities. The initiative is in keeping with the organization thrust towards building capacity the local level. Participants were taught how to prepare community hazard maps based on their own experiences and local knowledge.

General training of hazards was also conducted. Other training in community hazard mapping was carried out with the National Youth Service. Approximately 300 volunteers participated in the disaster management programme and were trained in community hazard mapping and Initial Damage assessment.

2009 Report

Development and testing of the vulnerability ranking methodology for identifying and prioritizing, was conducted for vulnerable Communities across Jamaica. Community hazard mapping was also conducted for two communities, Annotto Bay and Port Maria in the parish of St. Mary. Three (3) Coastal areas have been selected for mapping under the IDB project. Informal developments were also identified and mapped.

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.

2007 Report

The Mines & Geology Division recently completed and printed the Portland Landslide Hazard Susceptibility Map, and work has commenced on the Landslide Hazard Mapping Project for St. Catherine.

Additionally, the Flood Hazard Map for Portmore has also been completed. The information from this project will be used to update the Portmore Evacuation Plan.

The WRA is moving to have the Water Resources Act 1995 amended to take responsibility for the regulation of Floodwater Control. This will give the WRA the legal mandate to be more proactive in the management of flood risk through the

- Mapping of flood prone areas
- The development of flood plain maps
- The installation and operation of flood alert/warning systems
- The modeling of rainfall runoff and storm surges; and
- The preparation of a Floodwater Control Master plan for the island

The draft amendments have been completed and two stakeholder workshops held to get feedback which has been incorporated in the amendments. The draft legislation is to go to the legislative committee of Parliament in the 2007 legislative year. In the interim the WRA has completed flood plain maps for selected reaches of the Rio Cobre, Yallahs, Rio Minho, Hope River and Rio Grande Rivers. In addition hydrological assessments (modeling) of flooding in the Black River Upper Morass, St. Elizabeth and at Nightingale Grove in St. Catherine have been completed. The WRA also works closely with the ODPEM in the establishment of community flood alert systems to support the NDMP.

2008 Report

The draft amendments to the WRA Act (1995) were reviewed in April 2008 by the legislative committee of Parliament and are now to be tabled in Parliament for implementation in April 2009. The Ministry of Transport and Works has requested a two month hold on the tabling in Parliament to enable the Ministry and new Ministers to review the documents. It is anticipated that the tabling will take place within this legislative year.

In the interim, the WRA has completed flood plain maps for selected reaches of the Rio Cobre, Yallahs, Rio Minho, Hope River and Rio Grande Rivers. In addition hydrological assessments (modeling) of flooding in the Black River Upper Morass, St. Elizabeth and Kennedy Grove in Clarendon have been completed. The WRA is now completing the hydrological assessment of Nightingale Grove in St. Catherine. The WRA has worked closely with ODPEM to establish 7 community flood warning systems and trained community members in the operation of the systems to support the NDMP.

The WRA has also undertaken a project to develop a groundwater information system for the hydrological basins across the island. The geographic information system (GIS) to formulate aquifer protection zones and identify and delineate water quality control zones within each basin.

It was decided to employ the DRASTIC model in conjunction with the use of ARCVIEW in the mapping of aquifer vulnerability.

DRASTIC is groundwater quality model for evaluating the pollution potential of large areas using the hydro-geologic settings of the region. This model employs a numerical ranking system that assigns relative weights to various parameters that help in the evaluation of the relative groundwater vulnerability to contamination.

The pilot site for this project is the Rio Cobre Basin, and to date, all the data for the various factors such as (D) Depth to water table, (R) Recharge (Net), (A) Aquifer

Media, (S) Soil Media, (T) Topography (Slope), (I) Impact of Vadose Zone and (C) Conductivity (Hydraulic) have been collated. Each factor has been assigned a weight based on its relative significance in affecting the pollution potential.

The next phase involves the overlapping of the various layers using ARCVIEW to obtain a vulnerability map for the basin. The project will be completed in 2009.

Work is currently underway through the Mines and Geology Division on the Landslide Hazard Mapping Project for St. Catherine. This project was affected by the reallocation of resources to deal with damage assessment surveys and hazard vulnerability assessments resulting from Hurricane Dean.

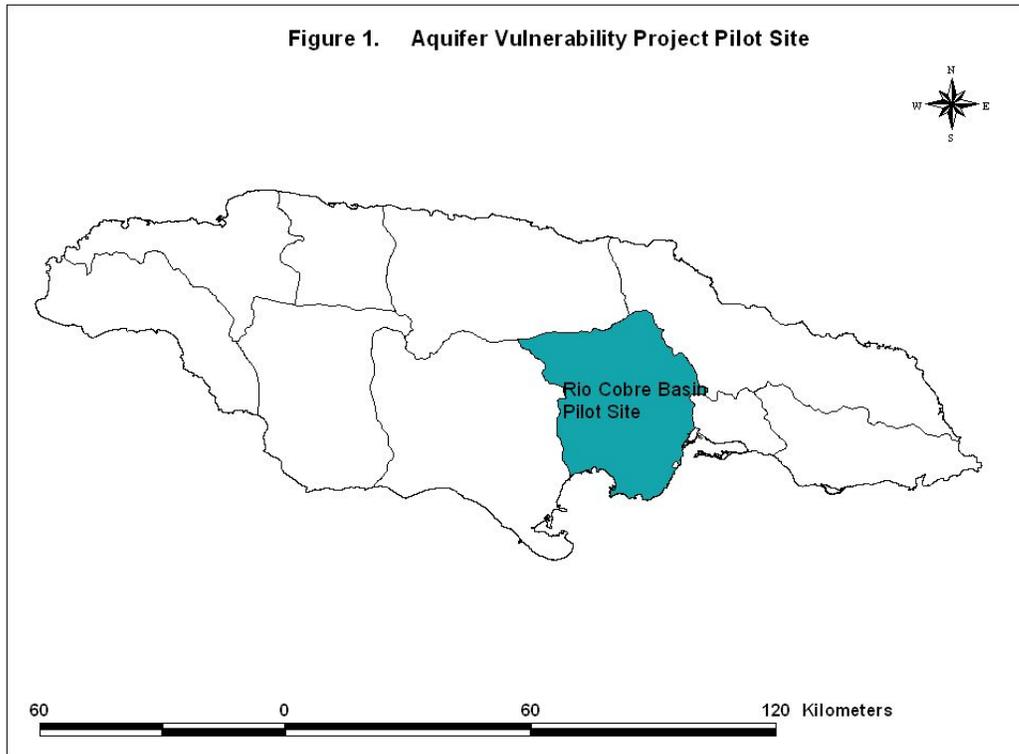
2009 Report

The Mines and Geology Division has now completed the field work for the Landslide Hazard Mapping Project for the parish of St. Catherine. GIS analysis and reverification of the data is currently being conducted.

The Water Resources Authority is moving to have the Water Resources Act 1995 amended to take responsibility for the regulation of Floodwater Control. This will give the WRA the legal mandate to be more proactive in the management of flood risk through the:

- Mapping of flood prone areas
- Development of flood plain maps
- Installation and operation of flood alert/warning systems
- Modeling of rainfall runoff and storm surges; and
- Preparation of a Floodwater Control Master Plan for the island

The draft amendments were reviewed in April 2008 by the Legislative Committee of Parliament and are now to be tabled in Parliament for implementation in April 2009.



The next phase involves the overlaying of the various layers using ARCVIEW to obtain a vulnerability map for the basin. The project will be completed in 2009.

Action # 15.8

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

2007 Report

The WRA has developed and manages one (1) real time flood warning system in the Rio Cobre Basin. It also assists the ODPEM in the establishment of several community flood alert systems across the island. The real time system is obsolete as the manufacturer of the equipment no longer maintains it. The WRA has kept the system functioning through the skill and capability of its staff. Funding was provided in the 2006/2007 budget to upgrade the system. The new equipment has been located, ordered and will arrive shortly for installation before the start of 2008. Once the floodwater legislation referred to in Action #15.7 is promulgated the WRA will expand the flood alert/warning systems.

2009 Report

The WRA has completed flood plain maps for selected reaches of the Rio Cobre, Yallahs, Rio Minho, Hope River and Rio Grande Rivers. In addition, hydrological assessments (modelling) of flooding in the Black River Upper Morass, St. Elizabeth and Kennedy Grove in Clarendon have been completed. The WRA is now completing the hydrological assessment of Nightingale Grove in St. Catherine. The WRA has worked closely with the ODPEM to establish seven (7) community flood warning systems and has trained community members in the operation of the systems to support the NDMP.

Action # 15.9

The MH&E will work with its Caribbean partners in the development and implementation of a Tsunami Early Warning System.

200 Report

A Tsunami Early Warning System protocol for Jamaica has been prepared.

B. CLIMATE CHANGE AND SEA LEVEL RISE

Action # 15.10

The MH&E 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.

2009 Report

Sea Level Rise equipment was refurbished at Port Royal and the Meteorological Service is now collecting data.

Action 15.11

The MH&E 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.

2009 Report

A report on this action is not available.

Action # 15.12

The MH&E will work closely with the Caribbean Climate Change Centre, including work impacting on sea level rise, and climate modelling.

2009 Report

Sea Level Rise equipment was refurbished at Port Royal and the Meteorological Service is now collecting data.

C. OIL SPILLS

Action # 15.13

The MH&E will review and revise the National Oil Spill Contingency Plan. The plan is to take into account hazardous and noxious substances also.

2009 Report

A report on this action is not available.

16. MULTI-LATERAL ENVIRONMENTAL AGREEMENTS

Indicators

Indicator	Source of Data
Ratification of MEAs and the implementation of local action plans	MH&E

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 MH&E will collaborate with the CPC to ensure promulgation of the Ozone Act.

2009 Report

See Action 5.3 above.

Action # 16.2

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

2007 Report

This action has been achieved.

Action # 16.3

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

2009 Report

The methyl bromide phase out programme is ongoing. A Technical Assistance Project, with funding from the Multilateral Fund of the Montreal Protocol, started in 2007. This includes training in the application of ECO2 fume, an alternative fumigant, as well as in Integrated Pest Management and Commodity Management. Phase 1 – Practical Training of Trainers was completed in 2008 involving participants from the Food Storage and Infestation Division, Rural Agricultural Development Authority, the Pesticides Control Authority and the Plant Quarantine Division.

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

Action # 16.4

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

2009 Report

The Meteorological Service will develop the Second National Communication which will include an Implementation Plan: Work on the preparation of the Second National Communication to the UNFCCC started in September 2006 and is expected to be completed by the end of 2009.

Work has been completed on the Green House Gas Inventory (GHGI) component of the Second National Communication of Jamaica and includes:

- A compilation of the GHG inventory for the years 2000 – 2005.
 - A compilation of anthropogenic emissions of Carbon Dioxide by source and removal by sinks, Nitrous Oxide, and Methane, and a report on HFCs, PFCs and SF6
 - The 2006 IPCC Guidelines were used.
- The Vulnerability and Adaptation Assessment components of the Second National Communication of Jamaica were completed in the sectors/zones as reported in the 2007 Report.
- Work has started on the Mitigation Assessment component of the Second National Communication of Jamaica in all the areas referred to in the 2007 Report.
- The outcomes of the Second National Communication of Jamaica remain the same as referred to in the 2007 Report. Some public education and awareness has started and the Climate Change Video and songs have been completed.

Action # 16.5

The MH&E will implement projects through the facility of the Clean Development Mechanism (CDM) of the FCCC.

2008 Report

The first set of Certified Emissions Reduction Credits (CERs) were issued in February 2008 by the Executive Board of the Clean Development Mechanism for the Wigton Wind Farm Project, Jamaica's first project under the Clean Development Mechanism of the Kyoto Protocol for which Jamaica gave approval in 2006.

In March 2008, the Caribbean Cement Company Limited (CCCL) submitted for approval, a Blended Cement Project under the CCCL's Expansion and Modernization (E & M) Programme. The Project is being reviewed by the Ministry.

The Ministry also proposes to devise a promotional strategy for attracting other project proposals with CDM potential.

2009 Report

The approval of projects involving carbon credits trading was put on hold in 2008 as the Cabinet requested the preparation of a Carbon Emissions Trading Policy to enable Jamaica's participation in the Clean Development Mechanism (CDM) of the Kyoto Protocol and other carbon trading regimes.

A Task Force was convened in October 2008 by the Ministry of Energy and Mining to guide the development of the Policy.

There is also need for the formal appointment of the Designated National Authority of the CDM responsible for the evaluation of applications for CDM Projects, and the need to give the required approval in keeping with national policy, legislation and sustainable development criteria. A Cabinet Submission to this effect has been drafted and is expected to be considered in 2009/10.

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

Action # 16.6

The Office of the Prime Minister (formerly MH&E) will implement a National Implementation Plan (NIP) to achieve the objectives of the Convention.

2007 Report

By the end of the 3rd quarter of the 2007/8 financial year, the Ministry will forward the NIP to Cabinet for approval. Once the document has been approved, the Ministry, in collaboration with NEPA and other public and private sector stakeholders, will develop a slate of projects, for dissemination to development and funding Agencies to facilitate the implementation of activities outlined in the NIP.

2009 Report

The National Implementation Plan (NIP) is to be presented to Cabinet. It is anticipated that the approval NIP will be forwarded, through the Stockholm Convention Secretariat, to the Conference of the Parties of the Stockholm 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 Transport and Works will examine a proposal for the construction of such a facility.

2009 Report

The MARPOL Bill represents an initiative on the part of the Government of Jamaica to provide a basis for enforcement of the requirements under the MARPOL Convention. This Convention was designed to minimize pollution of the seas, including dumping, oil and exhaust pollution. Its stated object is: to preserve the marine environment through the complete elimination of pollution by oil and other harmful substances and the minimization of accidental discharge of such substances. To date the Bill is still a draft.

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

Action # 16.8

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

2007 Report

Five (5) permits were issued between 2005 and 2007 by NEPA under the NRCA Act for the trans-boundary movement of hazardous waste.

2008 Report

Two (2) permits were issued in 2008 by NEPA under the NRCA Act for the trans-boundary movement of hazardous waste.

2009 Report

Drafting instructions were prepared and sent to the Chief Parliamentary Counsel for amendments to the Natural Resources (Hazardous Wastes) (Control of Transboundary Movement) Regulations to more adequately reflect the provisions of the Basel Convention (including the new Notification and Movement Forms). It is anticipated that the amendments to the Regulations will be promulgated in the 2009/10 Financial Year.

- 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.

2009 Report

See Action 8.1.

- 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.

2009 Report

See Action 9.5.

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.

2009 Report

A report on this action is not available.

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.

2009 Report

See Action 8.5.

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

2007 Report

See Action 8.1.

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.

2009 Report

The draft Biosafety Policy was further reviewed by a Policy Review Sub-Committee of the NBC. Institutional arrangements for implementation of the Policy were also reviewed. The document is expected to be finalized for submission to Cabinet by the end of the 2009/2010 fiscal year.

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

Action # 16.15

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

2009 Report

A report on this action is not available.

APPENDIX A

List of participating Agencies/Institutions

- Cabinet Office
- Centre for Marine Sciences, UWI
- Environmental Health Unit
- Fisheries Division
- 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
- Ministry of Energy, Mining and Telecommunications
- Ministry of Health and Environment
- Ministry of Tourism
- Ministry of Transport and Works
- Ministry of Water and Housing
- National Commission on Science and Technology (NCST)
- National Environment and Planning Agency (NEPA)
- National Water Commission (NWC)
- 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)