2006 COUNTRY ENVIRONMENTAL ASSESSMENT (CEA) FOR JAMAICA

DRAFT REPORT

Prepared by:

Marbek Resource Consultants

In association with:

Claude Davis & Associates

ALL COMMENTS ON THIS DOCUMENT MUST BE SUBMITTED TO MARBEK RESOURCE CONSULTANTS BY

FRIDAY FEBRUARY 2, 2007, 6 PM EST.

MARBEK
Resource Consultants Ltd.

COUNTRY ENVIRONMENTAL ASSESSMENT (CEA) FOR JAMAICA

– REVIEW DRAFT: NOT FOR CITATION OR QUOTATION –

Submitted to:

Inter-American Development Bank

Submitted by:

Marbek Resource Consultants Ltd.

In association with:

Claude Davis & Associates

January 2007

Marbek Resource Consultants Ltd.
300-222 Somerset Street West
Ottawa, ON K2P 2G3
Tel: 613.523.0784 Fax: 613.523.0717
www.marbek.ca

Claude Davis & Associates
141Oakhampton Trail
Hamilton, ON L9B 0A3
Tel: 416.907.0795
Fax: 905.891.8997

Table of Contents

Acknowledgements:

[to be included in the final draft]

List of Tables

List of Figures

EXECUTIVE SUMMARY

CHAPTER 1. INTRODUCTION

The Inter-American Development Bank (IDB) recently adopted a new *Environmental and Safeguards Compliance Policy*. This policy requires that the Bank prepare a Country Environmental Assessment (CEA) for each borrowing country. The CEA is intended to provide analytical information on environmental and social issues in the context of Jamaica's engagement with the Bank.

The specific objective of the CEA is to identify opportunities for synergies between good environmental management and economic development, as well as environmental risks that can jeopardize economic and/or social development. The CEA is intended to serve as a strategic, high level environmental review, providing guidance for future Bank programming.

Work on the CEA began in late September 2006. This draft will be reviewed at a Stakeholder Workshop in late January 2007. The Final Report will be submitted in February 2007.

CHAPTER 2. BACKGROUND

Jamaica's Current Development Priorities and Plans

The UN Millennium Development Goals (MDGs), which Jamaica has endorsed, provide an overarching vision of the country's development priorities. Within this general context, the *Medium Term Socio-Economic Policy Framework 2004-2007* (MTSEPF) is the most current government document defining Jamaica's development priorities. The MTSEPF builds on the policy framework established in the 1996 *National Industrial Policy*.

Goal #7 of the MTSEPF is to ensure environmental sustainability and to improve national and local capacity for hazard risk management. This goal has 4 strategic objectives:

- Integrate the principles of sustainable development into country policies and programmes
- Reverse the loss of environmental resources
- Formalize the solid waste sub-sector to provide better public cleansing
- Minimize the impact of natural hazards.

Jamaica's development priorities and plans, as expressed in the MTSEPF, require an environmental management apparatus that is capable and effective. Otherwise, Jamaica's goal of sustainable development cannot be fully realized, and potential environmental issues associated with the development process are likely to impose unnecessary costs on Jamaican society.

The IDB's Engagement in Jamaica

The new *IDB Country Strategy with Jamaica* was released in August 2006. The Strategy was developed and adopted by the IDB and GoJ, with a focus on three strategic "pillars":

PILLAR A. PRIVATE SECTOR DEVELOPMENT	
Goal	Output/value added in the private sector expands in a sustainable & labor-intensive manner through organic growth and absorption of the informal sector
Objectives	Supportive macroeconomic framework Sound incentive framework and facilitative business environment Complementary inputs
PILLAR B. GETTING BETTER VALUE FOR MONEY	
Goal	Greater efficiency allows Jamaica to benefit more from a given level of resources
Objectives	Sectoral efficiency Project-level efficiency Public financial management
PILLAR C. REDUCING VULNERABILITY TO NATURAL DISASTERS	
Goal	Reduced vulnerability to natural disasters
Objectives	Appropriate comprehensive disaster risk management

The *Country Strategy* anticipates limited public sector investment lending. Instead, the focus is on policy-based lending, grant modalities for catalytic actions, and private sector lending.

The IDB has an established and ongoing involvement in the environment sector in Jamaica. Areas of activity have included water and wastewater; solid waste management; land use management; strengthening local government; supporting local sustainable development; strengthening environmental capacity of SMEs; and disaster risk management and response. These areas of activity provide a strong platform for future involvement in environmental initiatives in Jamaica.

CHAPTER 3. STATE OF JAMAICA'S ENVIRONMENT

This chapter provides a summary of the state of Jamaica's environment and natural resources. The presentation is organized by environmental stressor.

Releases to the Environment: Air

Current information on air pollutant emissions in Jamaica is limited, but ambient air quality data is available in the vicinities of some industrial facilities, and there is limited data for stations in Kingston. Between 2002 and 2005, measurements made in the vicinities of bauxite-alumina operations exceeded the Jamaican national ambient air quality standards for TSP or PM_{10} a total of 141 times. Some of the data collected in the vicinities of other industrial facilities are not always reported to NEPA and so there has been no overall national air quality assessment.

Cardiovascular and respiratory disease were respectively the fourth and sixth highest categories of government hospital care costs in 1996. Increases in the incidence of respiratory disease and the significant health care costs for respiratory care (J$177 million or 6.3% government hospital costs in 1996) were among the drivers for the recently promulgated Air Quality Regulations.

Releases to the Environment: Water

The main industries that generate trade effluent are the alumina, sugar, distillery, agri-processing, food and beverage, and brewing industries. About 70% of these facilities are in Kingston & St. Andrew where they contribute to the pollutant loading of Kingston Harbour.

Measurements of water quality in selected wells, rivers and springs between 1996 and 1999 show exceedances of water quality standards for irrigation, industrial use, recreation and ambient water quality standards. Water quality in rivers and springs show that ambient and recreational water quality standards were exceeded in all basins except for the Martha Brae River Basin, which met the ambient water quality standards. The exceedances in the various basins are accounted for by one or more of industrial effluents, saline water intrusion, or the presence of microbial organisms. Most surface waters fail to meet the recreational water quality standard because of microbial organisms which indicate faecal contamination from humans or animals. The contamination of water resources by human activity is being addressed in part by sewage effluent regulations and other initiatives designed to reduce the amount of sewage disposal in soak away pits and to improve water quality in effluent from sewage treatment plants.

Releases to the Environment: Solid Wastes

"Solid waste" (municipal, commercial and industrial) is nearly always cited as one of Jamaica's pressing environmental problems. Eight municipal waste disposal sites are in operation across Jamaica but none meet all of the generally recognised criteria to qualify as a landfill site. There are no proper facilities for the disposal of hazardous waste. Medical waste is currently separated (to some degree) and disposed of in "incinerators", few of which would likely meet the recently enacted air quality regulations. Less than 50% of Jamaican households have garbage collection (regular, irregular and private). Various initiatives are underway to recover or recycle some categories of waste, but in most cases the extent of these efforts is limited. Considerable quantities of waste are discharged in Jamaica's coastal waters, especially after heavy rainfall.

Land Use Pressures

In Jamaica land use pressures are greatest in coastal and urban areas, but in fact arise across the island. Contributing factors include urbanization, population growth in vulnerable areas, limited availability of affordable and accessible land for low-income earners, poor agricultural and forestry practices, poorly managed development and road construction projects, and human encroachment into forest reserves and protected areas. These land use pressures result in environmental degradation including exacerbation of erosion and flooding, degraded and diminishing wetlands, compromised water resources, and deteriorating coral reefs.

The most recent assessment of forest cover in Jamaica was completed in 1998. The majority of forest land has been disturbed and degraded, and only about 8 percent of the island remains as natural forest. However, in the 10-years prior to 1998 the cumulative loss of forested land was less than 1% (3064 hectares).

Over this same 10 year period, bauxite-related land use increased by about 5000 hectares, the largest increase among land use categories. The extension of mining operations, land areas required for dry stacking of red mud, and use of agricultural or forested areas for housing and other development projects will create additional land use pressure. Current proposals concerning bauxite mining in the Cockpit Country are emerging as a major policy issue..

Natural Resource Use

Jamaica's natural resources are a part of the country's heritage and an important foundation for future prosperity. Key economic sectors are dependent on natural resources – especially mining

(bauxite and alumina industry, limestone), agriculture and tourism. But use of natural resources can be an environmental stressor, directly and indirectly affecting the resource base itself.

Vulnerable biological resources show the impacts of resource use and other environmental stressors. For example, 14 endemic animal species and 200 endemic plant species are classified as critically imperilled or vulnerable to extinction, and Jamaican waters are now said to be the most over-fished in the English-speaking Caribbean.

Energy Development and Use

Jamaica's energy is provided primarily by heavy fuel oil (56.7%), diesel (16.9%) and gasoline (17%). The consumption of energy is dominated by bauxite and alumina processing (36.3%), electricity generation (23.8%) and transportation (22.4%).

Jamaica's search for energy alternatives will inevitably raise environmental management issues. Construction and ongoing management of LNG facilities requires strong and effectively applied environmental and safety standards. If petroleum exploration is successful and ultimately leads to production, the associated requirements for a strong environmental protection regime will be beyond what currently is in place in Jamaica. Ethanol production requires attention to issues such as environmentally sound agricultural practices, and management of effluents and wastes.

Natural Disasters/Hazards

Jamaica is susceptible to various natural hazards, including earthquakes, hurricanes, floods and landslides. Over the last 25-30 years Jamaica has experienced an increase in the frequency of natural events (particularly those related to extreme weather), and vulnerability has increased due to factors such as use of marginal lands and environmental degradation.

Hurricanes result in loss of life and a wide range of damage due to wind, flooding, landslides and storm surge. Some of the largest losses of life have been associated with storm surge, occasionally reaching heights of 20 to 30 feet at the coastline. Jamaica's reefs and beaches have also been severely affected by storm surges associated with hurricanes. Flooding due to high intensity rainfall is exacerbated by human activities (poor land use, unauthorised or ill-informed construction in river beds/flood prone areas, blocked drains, etc.). Flooding has been a frequent event resulting not only in economic loss (damaged infrastructure, crops) but also in increased pollutant loading reaching coastal areas.

Climate change will amplify many of the natural hazards to which Jamaica is already exposed. In part this is because extreme weather events are likely to become both more frequent and more severe. In addition, as an island state Jamaica is largely dependent upon its coastline, and thus vulnerable to sea level rise associated with climate change. Key infrastructure is located in coastal regions, and tourism is concentrated in the coastal zone. The likely changes to Jamaica's rainfall are uncertain, but even minor changes could have significant impacts on water resources. In addition, sea level rise will directly impact these resources by causing increased saline intrusion in coastal aquifers. Agricultural impacts, such as soil erosion and increased vulnerability to pests, are also anticipated.

Summary

Jamaica is confronted with a range of important environmental challenges arising from past activities and practices, and these challenges are likely to become more significant in the future due to economic growth and other factors. Some of these challenges are relatively well understood or at least widely recognized (such as solid waste, wastewater, and local development planning). Other issues are emerging and warrant increased attention, including the impacts of various potential energy developments (oil and gas, LNG, ethanol), development projects in increasingly sensitive areas (e.g. bauxite mining in the Cockpit Country), and the expected impacts of climate change.

CHAPTER 4. ENVIRONMENTAL GOVERNANCE IN JAMAICA

This Chapter summarizes Jamaica's environmental governance framework, including selected policies, legislation, and organizations. The main report provides a more extensive listing.

Overall Development Policy Framework

The Medium Term Socio-Economic Policy Framework 2004-2007 (MTSEPF) is currently Jamaica's main development policy document (described above in Chapter 2). However, recognizing that the MTSEPF is a medium-term plan (three years), the PIOJ and the Ministry of Finance have embarked on a long term planning process to develop a *National Development Plan (NDP)* for the 2005-2030 period. The NDP process is intended to be a broad based plan with the overarching goal of achieving "developed country" status by 2030.

The NDP will build on another new initiative: the *National Sustainable Development Framework for Jamaica (Vision 2025)*, which is meant to promote effective mechanisms for achieving sustainable development goals, including the Millennium Development Goals (MDGs). This initiative will be led by a Sustainable Development Task Force chaired by the Cabinet Secretary.

Environmental Policy Framework

The Jamaica National Environmental Action Plan (JaNEAP) 1999-2002 is the Government of Jamaica action plan addressing environmental issues for the period 1999-2002. It was intended to address the commitments undertaken by the Government of Jamaica towards AGENDA 21 and the Small Island Developing States Programme of Action. A new JaNEAP is being drafted for the period 2007-2009.

In order to protect the environmental resources in Jamaica, a series of *thematic policies* have also been developed, covering such topics as Ocean and Coastal Zone Management, Protected Areas, and Watersheds. However, most of these policies remain as "green papers" or in draft form; only three thematic policies are in "white paper" form (finalized).

The Legislative and Regulatory Framework

Natural Resources Conservation Authority (NRCA) Act 1991 is the overriding legislation governing environmental management in Jamaica. The Act establishes the Natural Resources Conservation Authority, a body of persons appointed by the Minister of the Environment. The functions of the Authority include taking such steps that are necessary to ensure the effective

management of the physical environment of Jamaica and the management of marine parks and protected areas.

Town and Country Planning (TCP) Act 1958 is the principal legislation governing land use decisions in Jamaica. It is administered by the Town and Country Planning Authority through NEPA. The overall purpose of the Act is to ensure orderly development and to avoid illegal and unsuitable use of land. The TCP Act requires the preparation and implementation of Development Orders for the management and control of land use decisions. Currently Development Orders do not cover all areas of Jamaica, and most existing Orders are very dated.

Institutional Framework

The institutional framework in Jamaica offers a number of "points of entry" through which environmental governance can in principle be exercised. These points of entry include:

- The political/legislative arm of government, including Parliament and Parliamentary Committees, Cabinet and Cabinet Committees
- The Judiciary, with roles in criminal proceedings, civil legal action, and judicial reviews
- The public service, including the various ministries and agencies
- Local government.

The *National Environment and Planning Agency (NEPA)* is Jamaica's main environmental agency. NEPA's main functions are: to prepare development plans and development orders at national and parish levels; to process applications for development of land; to enforce environmental and planning laws and regulations; to manage and conserve the environment; to provide advice concerning environmental/planning policies; to participate in strengthening the capacity of parish councils; and to be the counterpart implementing agency for most major SD donor projects. A key NEPA responsibility is the Permit and Licence System (P&L), of which a key component is the Environmental Impact Assessment (EIA) process.

The Ministry of Local Government and Environment (MLGE) is the government Ministry with overall responsibility for NEPA (and for the local government authorities). The MLGE is mandated to set policy on local government reform, environmental management, and development planning.

Civil Society

Civil Society in Jamaica refers to a wide range of self-organized, relatively autonomous associations such as non-government organizations (NGOs), labour unions, political parties, faith-based organizations, community based organizations (CBOs), academic institutions and private sector associations. These organizations have demonstrated their commitment to partnership building, enjoying a relatively good working relationship with the GoJ. However, they are also facing challenges, including problems of resource accessibility and distribution, and restrictive funding agency policies. Specific additional challenges are faced by the NGOs that have been delegated responsibility for management of protected areas in Jamaica, most particularly the problem of financial sustainability.

The Private Sector

Over the last 10 years the private sector in Jamaica has improved its environmental practices. However, companies are faced with major barriers to business development, including a high cost of capital (currently up to about 17%). In these circumstances, it is difficult for companies to focus on better environmental management practices. There are nonetheless a few drivers for change in this area, including NEPA's emerging standards and regulations for air quality, sewage discharges and trade effluents; international standards faced by Jamaican exporters; and free trade and WTO negotiations.

Summary

Jamaica has an established environmental governance framework with significant elements in place, reflective of past and present concern for environment and sustainable development in both government and civil society. However, environmental governance in Jamaica suffers from important weaknesses arising from structural, capacity, and resource limitations. As a result, Jamaica is unable to consistently implement checks and balances to mitigate adverse and often localized social, economic and environmental impacts of development.

CHAPTER 5. CROSS-SECTORAL ISSUES

Overview

Jamaica has largely emerged from the financial crisis and associated debt shock of the 1990s with demonstrated achievement on key economic issues such as debt reduction and fiscal management. Programs are in place for public service reforms and efforts are being made to increase the rate of private investment. Inflation has been significantly reduced thereby increasing investor confidence and minimizing impacts on the poor, who tend to be disproportionately impacted by rising prices. Other positive changes include significant poverty reduction, rising real wages and income, and increased direct private and foreign investment.

Public debt management remains a critical component of the government's fiscal and macro-economic programme and will greatly influence the path of development for Jamaica over the medium-term. In order to manage the debt, Gross Domestic Product (GDP) growth will figure prominently with specific expansion targeted in the main productive sectors, namely bauxite mining/alumina processing and tourism. With the expansion of these sectors, there will be associated economic benefits such as increased employment, foreign exchange earnings and government revenue. While there are positive indicators of economic growth, there are real risks to development. The most significant of these would be the inability to achieve a broader set of environmental, social and economic objectives, especially over the longer-term.

The CEA provides an overview of two key productive sectors and the link between economic growth, resource use and environmental impacts. The bauxite and alumina and tourism sectors were selected for analysis because they are anticipated to be significant contributors to economic growth, are targeted by the GoJ as central to development policy, and have current and ongoing environmental impacts that are likely significant.

Key Economic Sectors: Bauxite and Alumina

Given sustained international demand, the government's need for foreign exchange earnings, direct foreign investment and government revenue will result in significant growth in the bauxite and alumina sector over the medium-term. While a wide range of economic benefits will flow from a continued expansion of the sector, there are development challenges. Notably, the land used for mining will constrain future land uses that currently support rural livelihoods. Removing this land from agriculture and other uses for very long periods of time may have implications for poverty reduction, especially among the rural poor whose livelihoods are more subsistence based. The dislocation of some people from areas slated for mine development can be expected to have negative social implications.

Important impacts on biodiversity can also be expected, thereby reducing Jamaica's natural capital. Water use and the generation of process waste (red mud) will continue to increase proportionately to production. This will have a number of effects, including water use conflicts, water supply depletion, and/or supply contamination. Also, while red mud is generally handled so as to reduce environmental impacts, the size of the waste problem will grow with increased development in this sector, thereby creating a higher risk of future downstream environmental impacts. Finally, uncontrolled refinery emissions are the dominant source of criteria air emissions in Jamaica; any increase in emissions can be expected to lead to increasing adverse health and economic damages. Table 5.5 in the main report provides further detail.

Key Economic Sectors: Tourism

The tourism sector is experiencing unprecedented growth due to increased foreign investment and demand for the "Jamaican product". Government is accommodating the growth through various polices and fiscal incentive arrangements. There is no doubt that the growth is fuelling employment, investment and foreign exchange earnings, but the net economic benefits are unclear. One example is the rising share of import substitution in goods consumed by the sector (and large resorts in particular) leading to lower spin-off benefits in the linked food and manufacturing sectors. Another example is the low levels of taxation enjoyed by the sector through long-term tax concessions and the rising cost of infrastructure and social services linked directly to resort development.

While economic growth is likely providing macro-economic benefits, a number of troubling regional issues are emerging that highlight the inability of local economies, societies and ecosystems to readily absorb the implications of unconstrained tourism growth. Notable examples include the link between tourism visits and urbanization; increased demands for social and infrastructure services (both direct and indirect from urbanization) and the resulting demand on government budgets; and limited local government decision-making in development planning. Other issues include the location of increasingly large resorts in valued and sensitive ecological areas; generation of wastes and resource depletion (notably water) associated with large resorts; and a deteriorating natural environment leading to a lower quality tourism product. This results in a situation where negative environmental and social impacts are increasing and impairing longer term development prospects while the macro-economic benefits of the sector are not optimized. Table 5.5 in the main report provides further detail.

Summary

The tight government fiscal situation and high public debt servicing will continue to drive economic policy, with decisions focused on short-term economic objectives such as foreign exchange earnings, debt servicing and direct foreign investment. This short term orientation tends to distort resource use decisions, leading to development outcomes that are likely sub-optimal. In the absence of sufficient governance controls and incentives to mitigate adverse outcomes, there is an increasing risk that GoJ economic, social and environmental objectives may not be achieved or may be impaired.

CHAPTER 6. ENVIRONMENTAL CHALLENGES & OPPORTUNITIES

General findings

Taken together, the previous chapters demonstrate that protection of the environment is central to Jamaica's development. More specifically, the previous chapters support the following broad conclusions:

Conclusion #1. Effective and broadly focussed environmental management is a fundamental requirement if Jamaica is to achieve its long term development objectives.

Conclusion #2. Because effective governance is essential to environmental management in Jamaica, the highest priority should be attached to initiatives that address critical institutional and governance issues.

Conclusion #3: Notwithstanding the overarching importance of governance, many specific environmental issues are also of critical importance and warrant action in the near term.

Key Governance Challenges

Strengthening the institutional and governance framework for environmental management is a fundamental requirement to resolve environmental issues, ensure that Jamaica's development goals are achieved, and ensure the success of IDB interventions.

Notwithstanding the fact that Jamaica has an established framework with significant elements in place, environmental governance in Jamaica suffers from weaknesses arising from structural, capacity, and resource limitations. All factors considered, the consulting team believes that the highest priority for governance programming should be assigned to:

- **NEPA and key collaborating organizations at the local level, and**
- **The private sector.**

The selection of **NEPA** as a priority was based on consideration of environmental "leverage", institutional potential, and other factors. Environmental "leverage" refers to the ability of an organization to make a significant difference in a wide range of environmental areas. NEPA is at the "epicenter" of environmental management in Jamaica, and for this reason above all others strengthening NEPA is fundamental to strengthening environmental governance in Jamaica.

Notwithstanding the very real challenges, NEPA is an established organization with staff, budget, and various policy, legislative, regulatory, and other management tools at its disposal.

The foundation that is needed to build a strong environmental management regime is in place. Accordingly, there is a opportunity for the IDB to help strengthen private sector environmental management. Some of the key areas in which assistance could be provided include:

- Development of overall environmental policy and finalization of thematic policies
- Completion and implementation of the updated legislative framework for NEPA
- Strengthening the EIA and permit and licensing processes
- Strengthening environmental enforcement
- Updating and strengthening development planning and control
- Strengthening collection, management, and distribution of environmental data
- Strengthening policy and technical capacity
- Strengthening capacity of NEPA/GoJ to meet international agreement obligations
- Strengthening capacity of NEPA to engage with partner organizations
- Strengthening capacity of local partner organizations collaborating with NEPA (Parish Councils, PDCs, delegated authority NGOs)
- Support for strategic studies and analyses (e.g. costs of environmental damage).

These concepts are further developed as **Recommendation #1,** presented in Chapter 7.

The **private sector** was selected as the second governance priority based in part on the important direct linkages with the *IDB Country Strategy for Jamaica*, which lists Private Sector Development as its first pillar. In addition, the private sector is the "engine" for much of the economic development anticipated in Jamaica's MTSEFP. A focus on private sector environmental capacity therefore links very directly to some of Jamaica's key development priorities. Enhanced environmental capacity of the private sector can make a significant contribution to environmental protection and support enhanced environmental governance.

There is a opportunity for the IDB and/or other organizations to help strengthen private sector environmental management. Specifically, two areas in which assistance could be provided are:

- Provision of on-site environmental audits and tech support to identify and help companies implement pollution prevention and efficiency opportunities
- Provision of low cost capital to enable investments in efficiency, clean technologies, and other environmentally beneficial alternatives.

These concepts are further developed as **Recommendation #2,** presented in Chapter 7.

Key Environmental Issues

Notwithstanding the overarching importance of governance, many specific environmental issues are also of critical importance and warrant action in the near term. Environmental stressors affect a wide range of human and natural resources. For existing issues, action now can mitigate impacts that may already be significant. For emerging issues, action now can help avoid or reduce problems before they become significant.

Based on stakeholder input, consideration of screening criteria, and consideration of past Bank engagement, the proposed priority environmental issues for possible Bank engagement are as follows:

- **Solid waste management**
- **Wastewater treatment**
- **Climate change adaptation**
- **"Green" Fiscal Reform and Tax Shifting.**

These concepts are further developed as **Recommendations #3-6,** presented in Chapter 7.

CHAPTER 7. DRAFT RECOMMENDATIONS FOR BANK SUPPORT

This final chapter recommends a small number of pragmatic and well justified environmental actions the bank could undertake in Jamaica over the next 4-5 years.

Please note that the recommendations presented here are drafts for discussion purposes. Following review by the Bank and by stakeholders, and following discussion in the January 2007 stakeholder workshop, these recommendations will be revised and finalized.

Recommendation #1: Support the strengthening of NEPA and agencies with which it interacts, in particular at the local level (local government, Parish Development Committees, delegated authority NGOs)	
Short term	Support NEPA needs assessment (mandate, structure, relationships, operations, capacity) and best practices review
	Support "Quick Start" initiatives: • Candidate 1: Analytic study assessing the annual costs of environmental degradation (GDP impact) • Candidate 2: Creation of an environmental data/information system and repository (linked to existing databases such as the one maintained by the WRA) • Candidate 3: Personnel support (e.g. senior cooperants for key HR gaps) • Candidate 4: Preparation of a development plan in a pilot parish based on best practice planning approaches • Candidate 5: Demonstration project with a selected protected area focusing on mechanisms for sustained financing • Candidate 6: Other high priority actions based on findings of the needs assessment
Longer term	Build towards possible policy-based loan supported by substantial TC grant

Recommendation #2: Support private sector access to low cost capital for investments in environmental protection	
Short to medium term	Design and establish a low interest revolving loan fund, integrated with on-site technical advisory assistance, to support investments in environmental protection including environmental management systems, pollution prevention practices, cleaner technologies, efficient technologies and practices, and pollution control

Recommendation #3: Provide renewed support to address solid waste management issues	
Short term	Support initial research as platform for renewed dialogue and possible engagement: • Candidate 1: Update study on required institutional, policy, & legislative arrangements • Candidate 2: Analytic study assessing the environmental costs of the current system • Candidate 3: Study of the technical and economic feasibility of recovery of waste streams
	Support consultation on future priorities
	Support capacity building activity as required to establish pre-conditions for possible future loan
Longer term	Build towards possible future investment loan in support of improved solid waste management (including hazardous and special wastes)

Recommendation #4: Support new initiatives to address wastewater management issues	
Short term	Support initial research: Study on required institutional, policy, & legislative and fiscal arrangements
	Support consultation on future priorities
Longer term	Build towards possible future investment loan in support of improved wastewater management

Recommendation #5: Expand Country Strategy focus on natural disasters to include adaptation to the impacts of climate change	
Short term	Support risk evaluation for natural and man-made disasters
	Support development of climate change vulnerability assessments and plans of action (complementing other initiatives)
	Support consultation on future priorities
Longer term	To be determined

Recommendation #6: Support "Green" Fiscal Reform and Tax Shifting	
Short term	In the planned comprehensive tax reform study, include a study of fees, subsidies, and tax shifting as means to reduce environmental impacts while improving the government's fiscal position
Longer term	In the planned policy-based loan: Implement justifiable fee, subsidy, and tax shifts ("green" fiscal reform and tax shifting)

In addition to the six primary recommendations outlined above, each of which outlines a set of possible new or enhanced initiatives, the consulting team offers the following additional recommendations:

Recommendation #7: The IDB activities in the area of disasters should encompass both natural and human-induced disasters.

Recommendation #8: The IDB and the GOJ should periodically engage in high-level dialogue specifically on environmental matter, in order to maximize the benefit of the IDB's engagement in Jamaica.

LIST OF ACRONYMS

BCE	Business Council for the Environment
BOD	Biological Oxygen Demand
BOJ	Bank of Jamaica
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CDA	Claude Davis and Associates
CEA	Country Environmental Assessment
CFC	Chlorofluorocarbons
CIDA	Canadian International Development Agency
COD	Chemical Oxygen Demand
CITES	Convention on International Trade in Endangered Species
EC	European Commission
EFJ	Environmental Foundation of Jamaica
EIA	Environmental Impact Assessment
ENGO	Environmental Non-governmental Organization
EU	European Union
FEE	Foundation for Environmental Education
GDP	Gross Domestic Product
GEF	Global Environment Facility
GoJ	Government of Jamaica
GPA	Global Programme of Action
HACCP	Hazard Analysis and Critical Control Point
ICRI	International Coral Reef Initiative
IDB	Inter-American Development Bank
IIC	Inter-American Investment Corporation
ISO	International Organization for Standardization
JaNEAP	Jamaica National Environmental Action Plan
JCRAP	Jamaica Coral Reef Action Plan
JEA	Jamaica Exporters Association
JIEP	Jamaica Institute of Environmental Professionals
JMA	Jamaica Manufacturers Association
KMA	Kingston Metropolitan Area
KSAC	Kingston and St. Andrew Corporation
LBA/LBS	Land-based Activities/Sources
LNG	Liquefied Natural Gas
MARPOL	International Convention for the Prevention of Pollution from Ships
MDGs	Millennium Development Goals
MFAFT	Ministry of Foreign Affairs and Foreign Trade
MIF	Multilateral Investment fund
MLGE	Ministry of Local Government and Environment
MOFP	Ministry of Finance and Planning
MRAJ	Motor Repairers Association of Jamaica
MTSEPF	Medium Term Socio-Economic Policy Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCSA	National Capacity Self-Assessment
NDP	National Development Plan

NEEAPSD	National Environmental Education Action Plan for Sustainable Development
NEEC	National Environmental Education Committee
NEPA	National Environment and Planning Agency
NEPPS	National Environment and Planning Policy and Strategy
NGO	Non-governmental Organization
NHDC	National Housing Development Corporation
NHT	National Housing Trust
NIP	National Industrial Policy
NLA	National Land Agency
NO_X/NO_2	Nitrogen Oxides/Nitrogen Dioxide
NPA	National Program of Action
NRCA	Natural Resources Conservation Authority
NSDF	National Sustainable Development Framework
NSWMA	National Solid Waste Management Authority
NWC	National Water Commission
O_3	Ozone
PCBs	Polychlorinated biphenyls
PDCs	Parish Development Committees
PIOJ	Planning Institute of Jamaica
PM	Particulate Matter
PRI	Policy Research Initiative
PSMP	Public Sector Modernization Programme
PSOJ	Private Sector Organization of Jamaica
RADA	Rural Agricultural Development Authority
SBAJ	Small Business Association of Jamaica
SDC	Social Development Commission
SEA	Strategic Environmental Assessment
SIDS	Small Island Developing States
SO_2	Sulphur Dioxide
SOE	State of the Environment
SPF	Social Policy Framework
STATIN	Statistical Institute of Jamaica
STP	Sewage Treatment Plants
TCP	Town and Country Planning
TDS	Total Dissolved Solids
TSP	Total Suspended Particulate
UDC	Urban Development Corporation
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United National Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
UWI	University of West Indies
WRA	Water Resources Authority
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization

CHAPTER 1. INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

The Inter-American Development Bank (IDB) recently adopted a new *Environmental and Safeguards Compliance Policy*[1]. This policy requires that the Bank prepare a Country Environmental Assessment (CEA) for each borrowing country. For Jamaica, the IDB contracted preparation of the CEA to a consortium of Marbek Resource Consultants and Claude Davis and Associates, working in collaboration with Technological and Environmental Management Network (TEMN) of Kingston.

The CEA is intended to provide important analytical information on environmental and social issues in the context of Jamaica's engagement with the Bank. The specific objective of the CEA is to identify opportunities for synergies between good environmental management and economic development, as well as environmental risks that can jeopardize economic and/or social development. Based on a cross-sector dialogue, the CEA should provide the Government of Jamaica and the Bank with timely, relevant and practicable analyses that can assist in furthering environmental mainstreaming and support strategic improvements in key areas of environmental management.

The Terms of Reference for the CEA identify three primary areas for analysis:

- The state of Jamaica's environment and natural resources
- The environmental governance framework
- Cross-sectoral issues (in particular, socio-economic issues).

This analysis was intended to provide a basis for development of recommendations for Bank support and financing, and thus serve as a guide for future IDB activity in Jamaica. The Terms of Reference suggest that such future priority activity might relate to:

- Aspects of private sector development, poverty reduction, or vulnerability to natural disasters, and/or
- Management of resource-dependent economic sectors or of socially important services.

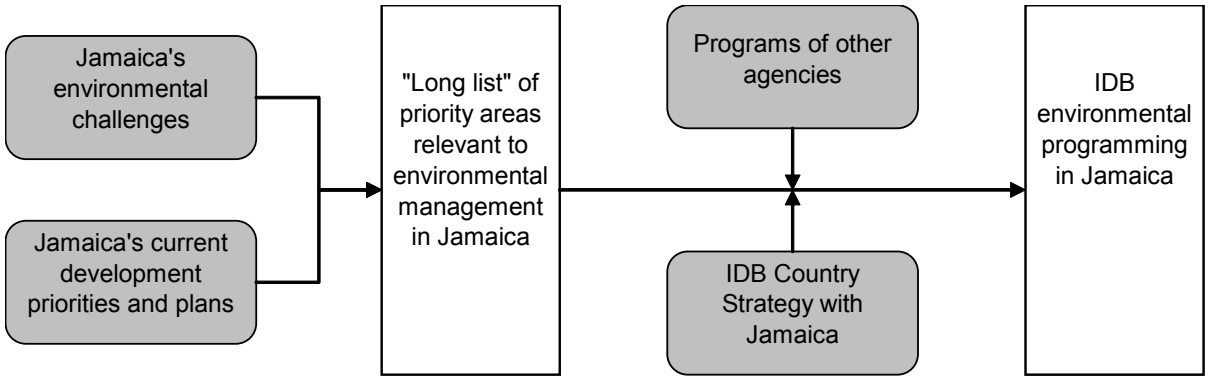
1.2 METHODOLOGY

1.2.1 Overview

Based in part on the CEA Terms of Reference and in part on early input from stakeholders in Jamaica, the consulting team developed a "CEA Flowchart" that served as the conceptual framework for the analysis. This flowchart is presented in Figure 1.1.

[1] Inter-American Development Bank. *Environment and Safeguards Compliance Policy*. January 19, 2006. Washington, D.C

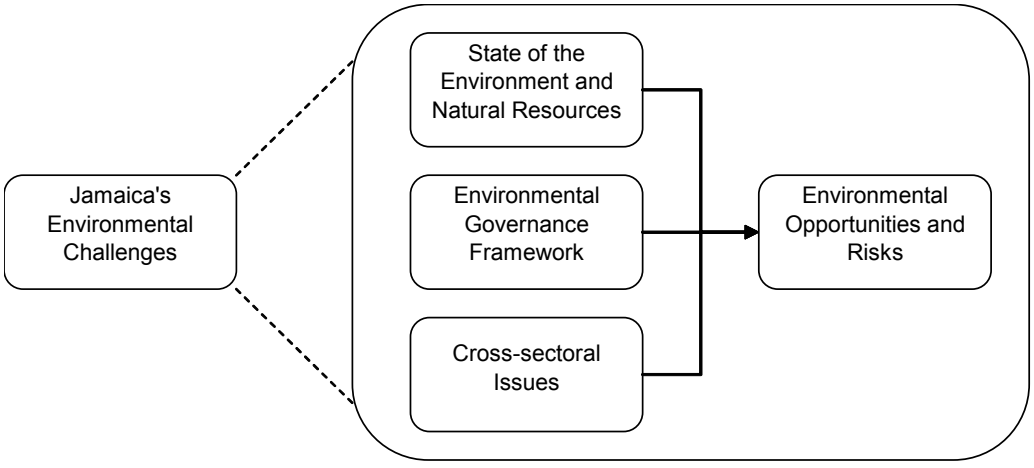
Figure 1.1: CEA Flowchart



As indicated by the highlighted cells in Figure 1.1, CEA recommendations regarding IDB environmental programming in Jamaica have been developed iteratively based on four key factors. Three of these factors are considered at a general level in this report: Jamaica's current development priorities and plans and the IDB's Country Strategy with Jamaica are discussed in Chapter 2, and the programmes of other agencies are discussed in Chapter 6.

The remaining factor -- Jamaica's environmental challenges – is addressed in more detail in this report. In conformity with the with the Terms of Reference presented in Section 1.1, the CEA review of Jamaica's environmental challenges has considered not only the state of the environment, but also Jamaica's environmental governance framework and key cross-sectoral issues. Figure 1.2 illustrates the scope of the review. Chapters 3-6 present the detailed results.

Figure 1.2: Environmental Challenges



1.2.2 Workplan

Work on the CEA was initiated in late September 2006. Key project milestones to date have included an Interim Report in October 2006 and submission of this Draft Final Report in early January 2007. Remaining key project milestones include a Stakeholder Workshop to take place in late January 2007, and submission of the Final Report in February 2007.

Throughout the CEA process, consultation with Jamaican stakeholders has been a core activity. Annex 2 provides a list of stakeholders consulted during the various stages of the assessment.[2]

The key completed and planned workplan elements have been / are as follows:

Initial Review

The first steps in the development of the CEA included a broad literature review and a dialogue process with Jamaican stakeholders and Bank staff. The dialogue process included: (1) key informant interviews, in some cases with several persons from a given sector, and (2) three small group meetings to obtain information, encourage dialogue, and test early ideas. One of the small group meetings was with the members of the IDB Civil Society Advisory Committee.

Based on this initial review, the consultant team prepared a brief Interim Report that presented initial findings and directions for the next stages of the assessment.

Detailed Review

Based on the initial findings, the consulting team undertook a second round of literature review and key informant interviews (some by telephone). In general these research and analysis activities became more focussed, "drilling down" in selected priority areas.

Preliminary Recommendations

Based on this background, the consulting team began to develop preliminary recommendations concerning areas of possible involvement by the Bank. These emerging recommendations were "road tested" in two informal working sessions involving a small number of key informant stakeholders who had previously met with the consulting team. In addition, these emerging concepts were discussed bilaterally with the IDB and with key organizations unable to participate in the "road test" sessions.

Draft Report

Based on the previous workplan activities, the consulting team prepared and submitted this draft report, to provide a basis for discussion at the stakeholder workshop in late January 2007.

Stakeholder Workshop and Final Report

The stakeholder workshop will provide the next opportunity for input to the development of the CEA. Workshop participants will include the key informants who have already been involved in

[2] Annex 2 to be provided in the final draft of this report.

the CEA (building on the engagement already established), and new participants to broaden the reach and the range of input.

Following the workshop, the consultants will revise and finalize the CEA report to take account of input received. As noted previously, the final report will be submitted to the IDB in February 2007.

1.2.3 Limitations

The CEA is intended to serve as a strategic, high level environmental review. It is NOT a detailed state of the environment report, nor is it a detailed environmental assessment of a specific policy or project. The CEA analyzes available environmental, governance, and cross-sectoral information to provide important guidance for future programming. In so doing it provides a foundation for more specific reviews and assessments if and as required.

For some aspects of the CEA, information availability has been a significant challenge (for instance, for a number of issues state of the environment information is limited, and what information is available often comes from disparate sources). Overall this information constraint has not been a barrier to completion of the CEA, given the strategic focus of this analysis. But as will be seen later in this report, information gaps have of necessity limited the range of the analysis in some areas.

1.3 THIS REPORT

The balance of this report is organized into the following chapters:

- **Chapter 2** provides background information on Jamaica's development priorities and plans, and on the Bank's current engagement in Jamaica (including the *Country Strategy*)
- **Chapter 3** provides an overview of the state of Jamaica's environment and natural resources
- **Chapter 4** provides an overview of environmental governance in Jamaica
- **Chapter 5** provides an overview of cross-sectoral issues (particularly socio-economic issues)
- **Chapter 6** provides a synthesis of the findings of the previous chapters, leading to a discussion of environmental challenges and opportunities
- **Chapter 7** presents draft recommendations for possible IDB support.

Annex 1 provides a full bibliography, and Annex 2 provides a list of participating stakeholders (to be included in the final draft of this report).

CHAPTER 2. BACKGROUND

2.1 JAMAICA'S CURRENT DEVELOPMENT PRIORITIES AND PLANS

The UN Millennium Development Goals (MDGs)[3], which Jamaica has endorsed, provide an overarching vision of the country's development priorities:

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a global partnership for development.

Within this general context, the *Medium Term Socio-Economic Policy Framework 2004-2007* (MTSEPF)[4] is the most current government document defining Jamaica's development priorities. The MTSEPF presents a wide range of economic and social policy goals for Jamaica. Table 2.1 summarizes the economic policy goals, and Table 2.2 summarizes the social policy goals.

Table 2.1: MTSEPF Economic Policy Goals

OVERALL POLICY GOALS	STRATEGIC OBJECTIVES
1. Fiscal Policies: Maintain stable macro economic framework to improve business and financial confidence and create predictability. Raise the GDP growth rate from 2.2% to 3.0% and maintain it thereafter; eliminate budget deficit by 2005/06 and generate a modest budget surplus thereafter; reduce debt to GDP ratio to less than 100%.	Maintain primary surplus in excess of 10%. Reduce public sector expenditure by reducing the wage bill in real terms whilst permitting salary increases of up to 3% in nominal terms; developing and supporting the Public Sector Modernization programme; improving prioritization of budget expenditures; avoiding incremental indebtedness.
2. Monetary Policies: Keep inflation in single digit range; improve competitiveness.	Reduce the spread between lending and borrowing rates in an environment of greater stability and predictability; reduce real interest rates <5%; reduce interest rate on domestic debt; keep REER competitive by ensuring that the exchange rate maintains its competitiveness, whilst gradually facilitating a convergence in inflation rates between Jamaica and its main trading partners.

[3] The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. The MDGs are drawn from the actions and targets contained in the Millennium Declaration that was adopted by 189 nations-and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000. Further details concerning the (MDGs) may be viewed at www.un.org/millenniumgoals

[4] Planning Institute of Jamaica. *Medium Term Socio- Economic Policy Framework 2004-2007* (MTSEPF). February 2005.

Table 2.2: MTSEPF Social Policy Goals

OVERALL POLICY GOALS	STRATEGIC OBJECTIVES
1. Consolidate social sector gains achieved over past decade	Optimize resource allocation to adequately finance critical social development areas
	Review the use of fees and user charges to maximize Government revenues whilst protecting the poor
	Ensure adequate service delivery in the health sector
2. Improved educational outcomes	Promote early childhood development services
	Promote full access to educational opportunities for children and youth at all levels of the education system
	Full enrolment at the upper secondary education level
	Improve the teaching /learning processes
	Promotion of Lifelong learning
	Decentralized school management
3. Prevention and control of morbidity and mortality	Promote and facilitate healthy lifestyles
	Improve epidemiological and nutrition surveillance; immunization coverage; management of patients and disease conditions
	HIV/AIDS Prevention and Care: Create multi-sectoral response; reduce transmission of the virus; reduce individual vulnerability to the infection; improve care, support and treatment services for PLWHA
	Data-informed and evidence-based planning in health: Improve data collection and monitoring of vital statistics
4. Reduction of poverty and increased social inclusion for the poor	Implement targeted development based social welfare policies and programmes
	Introduce new legislation to guide client focused welfare system
	Minimize the impact of natural and man-made hazards on the poor
5. Crime prevention and reduction	Reform, modernize and strengthen capacity of the JCF
	Develop National Security Strategy through broad-based consultation
	Reduce Corruption among the Police
	Implement strategies for community crime prevention
	Expansion of Peace Management Initiatives
	Adopt national strategy to reduce the demand and supply of illicit drugs
	Efficiently execute the custodial sentences of the Courts of Jamaica by rehabilitating and reintegrating offenders; protect the human rights of inmates
	Reduce the incidence of Youth violence.
6. Justice Sector Reform	Support policy and advance legislative reform to underpin social stability and promote human rights of citizens
7. Ensuring Environmental Sustainability	Integrate the principles of sustainable development into country policies and programmes
	Reverse the loss of environmental resources
	Formalize the solid waste sub-sector to provide better public cleansing
	Improve national and local capacity for hazard risk management: Minimize the impact of natural hazards
8. Improving Governance	Expansion of participatory framework
	Enhanced public sector efficiency
	Increased openness in public management

A number of these policy goals and objectives are directly related to the environment, including especially Social Policy Goal #7 (Ensuring Environmental Sustainability). In addition, because of the many interactions between economic/social development and the environment, the full set of MTSEPF goals and objectives is also strongly linked to environmental considerations.

Because of this, it is clear that Jamaica's development priorities and plans require an environmental management apparatus that is capable and effective. Without strong environmental capacity, the consulting team believes that Jamaica's goal of sustainable development cannot be fully realized, and potential environmental issues/problems associated with the development process are likely to impose unnecessary costs on Jamaican society. In other words, the consulting team believes that Jamaica's development priorities and plans are both compatible with, and dependent on, sound environmental management.

2.2 THE IDB'S ENGAGEMENT IN JAMAICA

2.2.1 The *IDB Country Strategy with Jamaica*

The new *IDB Country Strategy with Jamaica*[5] was released in August 2006. The Strategy was developed and adopted by the IDB and GoJ, with a focus on three strategic "pillars":

- Private sector development
- Better value for money
- Reducing vulnerability to natural disasters

Table 2.3 provides more details on the strategic pillars.

Table 2.3: Summary of IDB Country Strategy Pillars, Goals, and Objectives

PILLAR A. PRIVATE SECTOR DEVELOPMENT	
Goal	Output/value added in the private sector expands in a sustainable & labor-intensive manner through organic growth and absorption of the informal sector
Objectives	Supportive macroeconomic framework o Maintenance of a stable and sustainable macroeconomic policy framework
	Sound incentive framework and facilitative business environment o Keep levels of real effective exchange rate, real wages, and interest rates competitive o Progress towards undistorted incentive framework that is neutral between sectors and activities and between capital and labour o Reduce business transaction costs and improve security of property rights
	Complementary inputs o Adequate quality and quantity of physical infrastructure o Entrepreneurship and technical skills
PILLAR B. GETTING BETTER VALUE FOR MONEY	
Goal	Greater efficiency allows Jamaica to benefit more from a given level of resources
Objectives	Sectoral efficiency
	Project-level efficiency
	Public financial management
PILLAR C. REDUCING VULNERABILITY TO NATURAL DISASTERS	
Goal	Reduced vulnerability to natural disasters
Objectives	Appropriate comprehensive disaster risk management

The *Country Strategy* anticipates limited public sector investment lending. Instead, the focus is on policy-based lending, grant modalities for catalytic actions, and private sector lending.

[5] Inter-American Development Bank. *IDB* ***Country Strategy with Jamaica(2006-2009).*** August 3, 2006.

The consulting team has reviewed the *Country Strategy*, and based on this has reached the following conclusions:

- As is the case with Jamaica's development priorities and plans, the *IDB Country Strategy* is both compatible with and dependent on sound environmental management. If the *Strategy* is to help generate sustainable development in Jamaica, it requires an environmental management apparatus that is capable and effective.

- The Strategy is sufficiently broad to allow efforts to mainstream environmental matters, and also to consider explicit environmental programming related to the defined "pillars" of the Strategy. Moreover, implementation of environmental initiatives in this period (2006-2009) may provide a foundation for stronger environmental components in future country strategies (post 2009).

2.2.2 Project Portfolio

The IDB has an established and ongoing involvement in the environment sector in Jamaica. Table 2.4 provides a brief summary of selected current and recent environment and related projects.

Table 2.4: Selected Current and Recent IDB Projects in Jamaica (Environment and Related)

PLANNED PROJECT COMPONENTS	IDB AMOUNT & STATUS
LOANS	
Kingston Metro Water Supply Rehabilitation: Reorganization and modernization of NWC; rehabilitation of potable water supply in KSA; rehabilitation of sewer collection system and KSA sewage treatment action plan.	US$40 million. Contract signed September 2005. Start-up of project activities expected late 2006.
Rural Water Program: Community-based approach to water supply and sanitation in rural Jamaica, involving community water organizations and private sector; institutional strengthening of Ministry of Water and Housing.	US$8 million. In progress.
Solid Waste Management: Priority investments at Riverton landfill site; closure of non-active dump sites across island; national solid waste action plan and legal/ institutional reforms.	US$3.8 million, reduced from $11.5 million. Balance of loan cancelled due to unmet targets.
Parish Infrastructure Development Program: Rehabilitation of parish infrastructure; legal and institutional reforms for Parish empowerment; strengthening of parish capacities and financial position; strengthening of community participation (PDCs); strengthening of Ministry of Local Government.	US$11.6 million, reduced from $35 million. Balance of loan cancelled due to unmet targets.
Land Administration and Management Program: Tenure regularization in St. Catherine; system for divestment and management of public land; system for land information; land use and development framework including integrated development plans for Spanish Town and Santa Cruz.	US$5.2 million, reduced from $8.4 million. Scope reduced and balance of loan cancelled due to unmet targets. Reduced project approaching completion.
Emergency Reconstruction Facility: Restoration of transportation, water supply, physical infrastructure following torrential rains, Hurricane Ivan; ODPEM and NEPA institutional strengthening.	US$ 14.9 million. Project nearing completion; institutional strengthening cancelled.
Other Loans with Environmental Elements or Implications: Northern Coastal Highway Improvement; National Road Services Improvement; National Irrigation Development Program.	
TECHNICAL COOPERATION (GRANTS)	
Water Resources Master Plan: Support to the WRA to prepare a water resources master plan.	US$145,000. Project is largely complete.
Kingston Urban Renewal: Urban renewal project with one component	US$1.2 million. In progress.

PLANNED PROJECT COMPONENTS	IDB AMOUNT & STATUS
addressing shelter and environment	
Program to Support Implementation of the Bank Action Plan for Improving Disaster Risk Management 2005-2008: Regional project, initially supporting country-specific risk assessments that will inform the Bank's Country Strategies and programming.	US$240,000 for Jamaica. Plan of Operations available.
Completed projects: Environmental Management of Kingston Harbour; Coastal Zone Management Portland Bight; Community Environmental Management St. Elizabeth	
MULTILATERAL INVESTMENT FUND (MIF)	
Upper Rio Grande Valley and Holywell Commercial Development Project: Sustainable development through community based tourism in the area of the Blue and John Crow Mountains National Park	US$92,000. In progress.
Implementation Quality Safety Systems. Training and other assistance to SMEs relating to HACCP and ISO 9000/14001 quality and environmental standards	US$800,000. In progress.

An additional relevant Technical Cooperation project is currently in preparation. The **Natural Hazard Management in Urban Coastal Areas** project includes risk analysis, education and awareness, and institutional strengthening, supported by a US$800,000 grant. The project falls within Pillar C of the *IDB Country Strategy*: Reducing Vulnerability to Natural Disasters.

In summary, the IDB has had substantial past and present involvement in environment and environmentally related projects. Areas of activity have included water and wastewater; solid waste management; land use management; strengthening local government; supporting local sustainable development; strengthening environmental capacity of SMEs; and disaster risk management and response. These areas of activity provide a strong platform for future involvement in environmental initiatives in Jamaica.

CHAPTER 3. STATE OF JAMAICA'S ENVIRONMENT

3.1 INTRODUCTION

This chapter provides a summary of the state of Jamaica's environment and natural resources. This is a broad topic that could be presented from a number of perspectives (by sector, by ecosystem, etc.). In this chapter, the presentation is organized by environmental stressor and presented in the following sub-sections:

3.2 Direct Releases to the Environment: Air
3.3 Direct Releases to the Environment: Water
3.4 Direct Releases to the Environment: Solid Wastes
3.5 Land use pressures
3.6 Natural resource use
3.7 Energy development and use
3.8 Natural disasters/hazards.

For both natural and human-induced stressors, environmental management practices and the related institutional arrangements and governance practices can exacerbate or mitigate the effects of the stressors. The institutional and governance issues are discussed in Chapter 4 of this report.

The linkages between environmental stressors and socio-economic development are both complex and strong. On the one hand, environmental stressors arise in part from economic activity (e.g., tourism, mining, agriculture, construction, manufacturing). On the other hand, environmental stressors can lead to adverse environmental and health outcomes (e.g., loss of biodiversity, degraded natural resources, increased vulnerability to natural hazards, etc.). These adverse outcomes can compromise economic growth and development. These issues are explored in Chapter 5 of this report.

3.2 RELEASES TO THE ENVIRONMENT: AIR

Air pollutant emissions and the resulting ambient air pollutant levels can have adverse effects on human health, materials, plants and animals. Information on releases is essential to understand the resulting ambient air quality and to identify the most appropriate actions that would reduce emissions and their adverse impacts.

3.2.1 Air Emissions

Direct releases to the air occur from various human activities as well as from natural processes. In Jamaica, information on releases is not compiled routinely and readily available information is sometimes dated. Based on available information, the main air pollutant sources in Jamaica are summarised in Figures 3.1 to 3.3.[6]

In 1994 industrial sources accounted for 65% and 35% respectively of sulphur dioxide (SO_2) and nitrogen oxides (NO_X) emissions (see Figures 3.1 and 3.2). Electricity generation accounted for an additional 29% and 18% respectively of SO_2 and NO_X emissions. The air quality regulations

[6] Source: Claude Davis & Associates and Kaizen Training & Management Consultants Ltd. *Technical Support Document For The Regulatory Impact Analysis For Air Quality Regulations Developed By The National Environment And Planning Agency.* Prepared for the National Environment and Planning Agency. November, 2002.

(2006) will regulate facilities that release up to 94% of SO_2 emissions and 53% of NO_X emissions. The air quality regulations do not address motor vehicle emissions but establish the framework for assessments of the emissions and for tracking the absolute and relative contributions of all air pollutant emissions. Other instruments (not under the jurisdiction of the National Environment and Planning Agency) will be used to control motor vehicle emissions.

Figure 3.1 : Jamaica's SO_2 Emissions (1994)

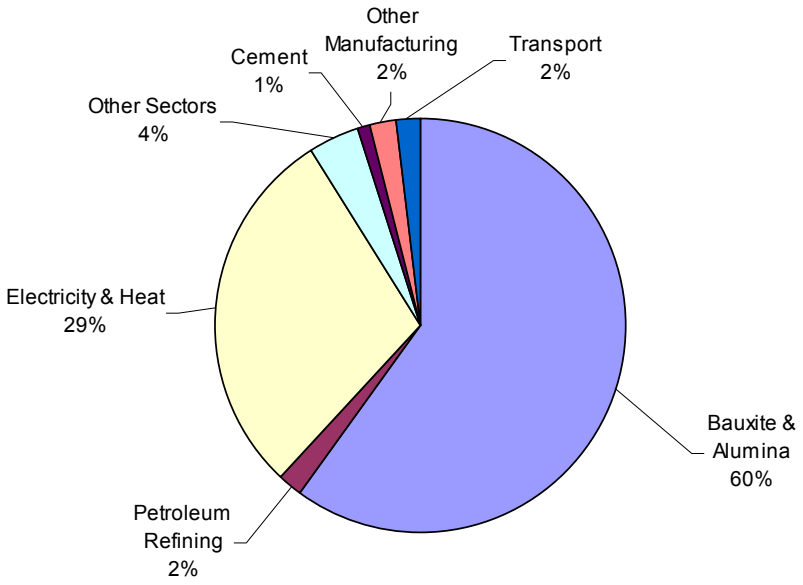


Figure 3.2 : Jamaica's NO_X Emissions (1994)

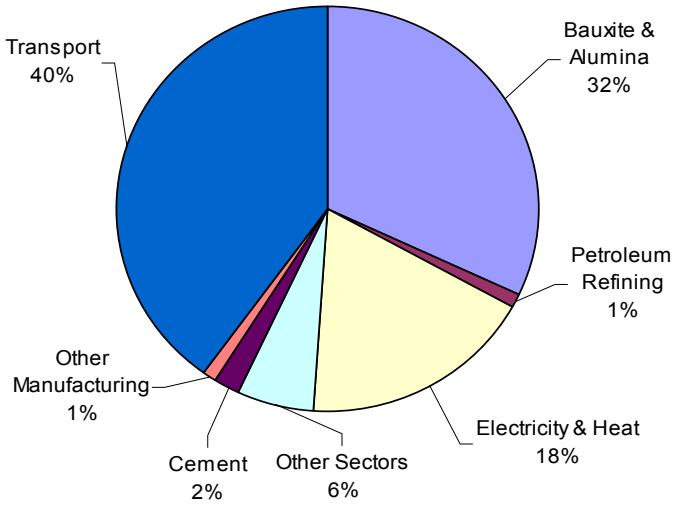
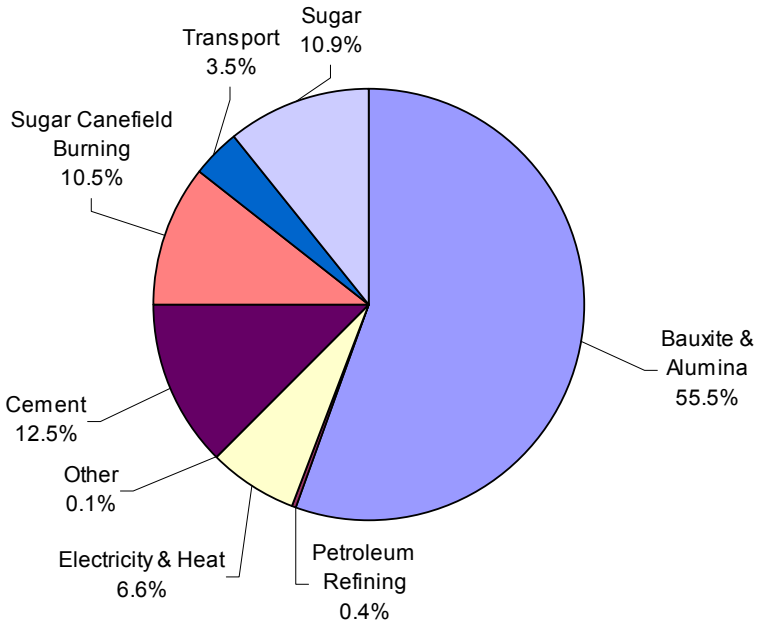


Figure 3.3 presents preliminary estimates of particulate matter (PM) emissions in 2000.[7] These estimates indicate that major industrial point sources (bauxite, alumina, lime, cement, sugar factories) and fugitive sources at the cement plant together account for 79% of the PM emissions. Electricity generation and heat production account for 6.6%. PM emissions from the open burning of sugar cane fields account for approximately 4,500 tonne/y or 10.5% of the total. Based on these figures, the air quality regulations will apply to facilities responsible for about 85% of the PM emissions from sources represented in Figure 3.3, the exceptions being motor vehicles and cane field burning.

Figure 3.3: Preliminary Estimate of Jamaica's PM Emissions in 2000



3.2.2 Ambient Air Quality[8]

Although current information on air pollutant emissions in Jamaica is lacking, ambient air quality data is available in the vicinities of some industrial facilities, and recently there is limited data for stations in Kingston. Specifically, routine ambient air quality measurements are being made in the vicinities of alumina plants (SO_2, TSP, PM_{10} and O_3), bauxite mines (dustfall, TSP), some heavy fuel oil-fired power stations (SO_2, NO_X), and recently at six urban locations in Kingston (SO_2, TSP, PM_{10}, CO, NO_2). In addition, some measurements are made in connection with a limited number of environmental impact assessments.

Between 2002 and 2005, measurements made in the vicinities of bauxite-alumina operations (mines, alumina plants, ports) exceeded the Jamaican national ambient air quality standards for TSP or PM_{10} a total of 141 times with most (125) exceedances at two stations near a port. The TSP standard was exceeded on two occasions in 2006 at one of the urban stations. Some of the

[7] PM emissions from fugitive sources at mining, quarrying and other large industrial facilities other than the cement plant, smaller facilities, agricultural operations, and the burning of household/yard waste are not included in the estimates.

[8] Source of data in this section: Claude Davis & Associates and Kaizen Training & Management Consultants Ltd. 2002 o*p.cit.* and personal communication Jamaica Bauxite Institute 2006.

data collected in the vicinities of other industrial facilities are not always reported to NEPA and so there has been no overall national air quality assessment.

Over 50% of the complaints received by NEPA are about poor air quality associated with industrial facilities (cement, alumina plants, odours from sewage treatment plants). Residents in the vicinities of alumina plants have historically complained about (and some have been compensated for) corrosion damage due to sulphur dioxide emissions.

Cardiovascular disease and respiratory disease were respectively the fourth and sixth highest categories of government hospital care costs in 1996. Increases in the incidence of respiratory disease and the significant health care costs for respiratory care (J$177 Million or 6.3% of costs in Jamaican government hospitals in 1996) are among the drivers for the recently promulgated Air Quality Regulations (2006).

3.3 RELEASES TO THE ENVIRONMENT: WATER

3.3.1 Releases

Sources

The main industries that generate **trade effluent** are the alumina, sugar, distillery, agri-processing, food and beverage, and brewing industries. Table 3.1 presents the distribution of these facilities by parish, showing that most (70%) are in Kingston & St. Andrew where they contribute to the pollutant loading of Kingston Harbour. Most of the remaining facilities are in St. Catherine (13%), Clarendon (4%), Manchester (5%) and St. Elizabeth (3%).

Table 3.1: Geographical Distribution of Facilities That Discharge Trade Effluent (2004)[9]

Parish	Estimated Number of Facilities Likely to Discharge more than 4000 m^3/y
Kingston & St Andrew	117
St Catherine	22
Clarendon	7
Manchester	8
St Elizabeth	5
Westmoreland	1
Hanover	0
Trelawny	2
St Ann	3
St Mary	1
Portland	1
St Thomas	1
Total	168

[9] Source: Claude Davis & Associates. *Report For Task B1: Identification And Characterization Of Industries And A Programme Strategy For Enforcing Environmental Discharge Limits From Industrial Polluters That Discharge Into Kingston Harbour.* Prepared For National Environment And Planning Agency. October 2004.

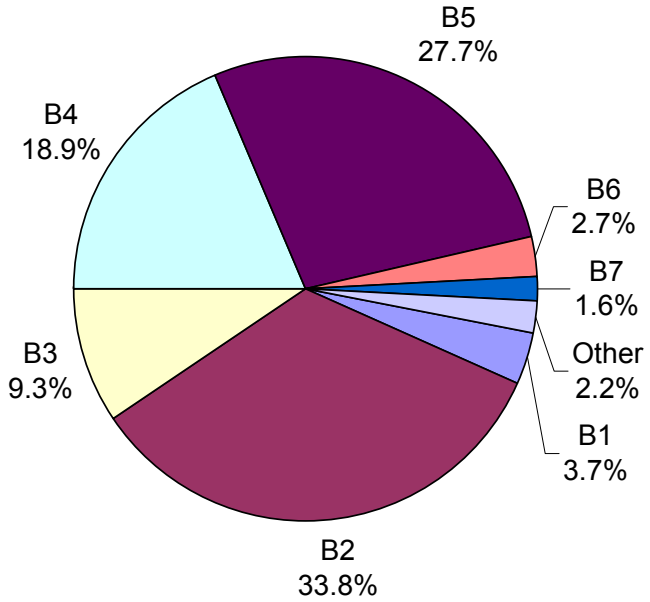
Information on the sources of **industrial sludge** (estimated at between 20 to 30 facilities) is more limited but the industries include bauxite, alumina, sugar, petroleum refining, petroleum storage and distribution, power generation, large dry cleaners, paint manufacturing and a variety of manufacturing industries.

Pollutant Loading

Measurements of flows and pollutant concentrations in trade effluent are limited. NEPA has sporadically collected data under Section 17 of the Natural Resources Conservation Authority (NRCA) Act for selected facilities. In addition, NEPA has made measurements on effluent from some facilities. Most of the regularly available data are from sugar, alumina and distillery facilities. (Some of the large water uses and hence largest trade effluent volumes occur in alumina plants and sugar factories.)

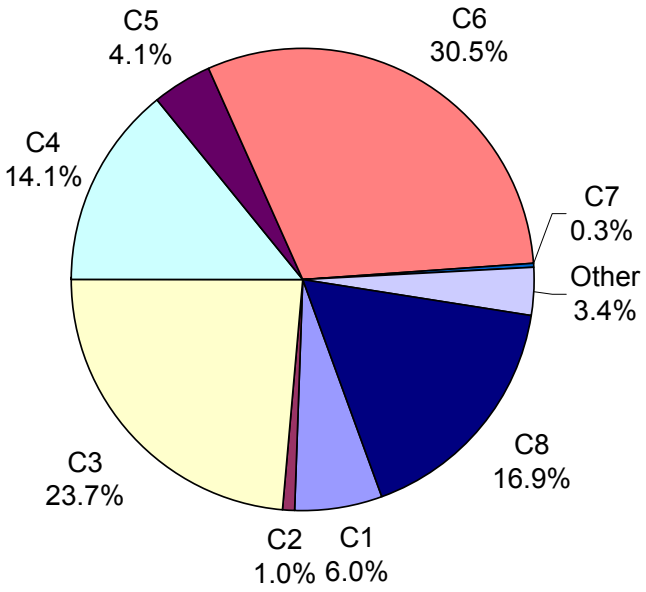
Estimates of pollutant loadings, defined as the effluent flow multiplied by the concentration, are available for trade facilities and sewage treatment plants (STPs) that discharge directly or indirectly into Kingston Harbour.[10] The loadings from industrial facilities in 2004 were estimated at 1,903 tonnes/y for BOD (27 facilities) and 6,396 tonnes/y COD (27 facilities). The percentage contributions from the seven (7) facilities with the highest BOD loadings and "All Others" for which there were available data are shown in Figure 3.4. Similar data for COD are shown in Figure 3.5. The four largest contributors of trade effluent discharge in the study area account for 90% of the BOD loading and 84% of the COD loading.

Figure 3.4: Estimates of the Relative BOD Loadings for the Top 8 and Other Facilities That Discharge Trade Effluent Into Kingston Harbour



[10] *Ibid*

Figure 3.5: Estimates of the Relative COD Loadings for the Top 8 and Other Facilities That Discharge Trade Effluent Into Kingston Harbour



These loadings can be compared with the loadings from sewage treatment plants (STPs) that discharge (directly or indirectly) into Kingston Harbour. Based on the maximum capacity values and the limited biological oxygen demand (BOD) data for STPs, the annual loading from the STPs for which data is available ranges from 3,600 to 18,000 tonnes BOD and 9,800 to 55,000 tonnes COD. After adjusting the data to avoid double counting industrial discharges into the sewer, the data suggests that industrial facilities accounted for between 10% and 35% of the BOD loading and 10% to 40% of the COD loading into Kingston Harbour in 2004.

Continued discharge of untreated or inadequately treated trade effluent into surface and underground waters will worsen the quality of Jamaica's water resources and will compromise the ability to obtain water of suitable quality at the lowest cost.

3.3.2 Water Quality

Water quality standards have been established for various types of water uses (drinking, irrigation, industrial use, recreation) as well as for ambient water quality. Figure 3.6 shows the locations of underground monitoring stations and their water quality while Figure 3.7 shows the river basins into which the island is divided and the aquifers that have been compromised by industrial effluents (sugar factory, distillery or alumina plants), sea water intrusion, or sewage.[11]

[11] Source: Personal Communication Water Resources Authority, December 2006.

Figure 3.6: Jamaica's Groundwater Quality Status 1990 to 1998

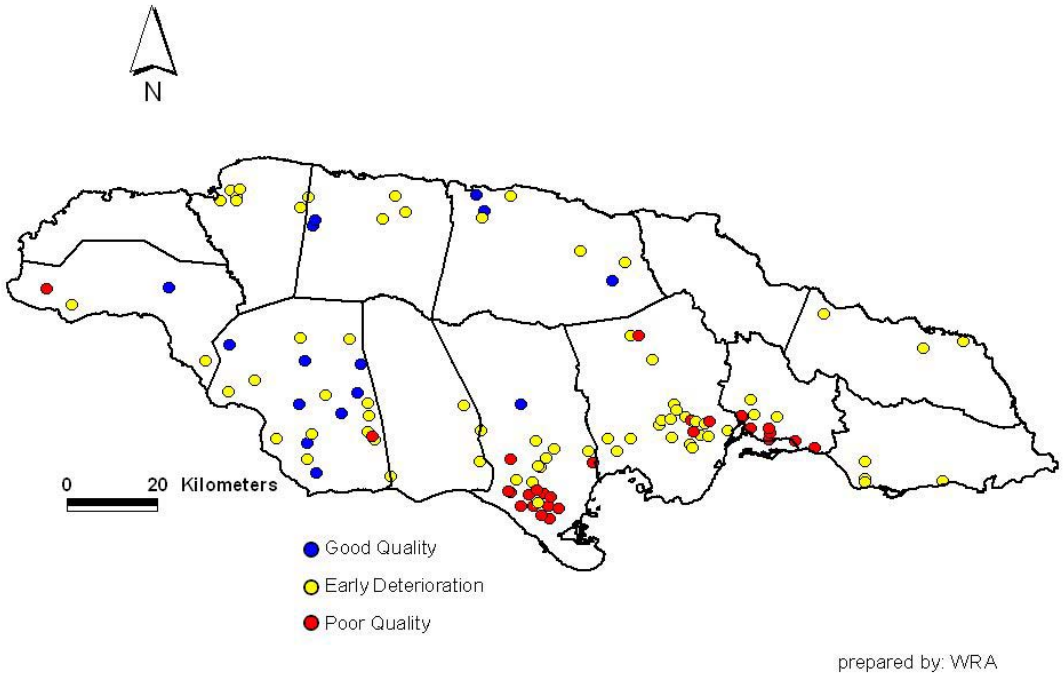
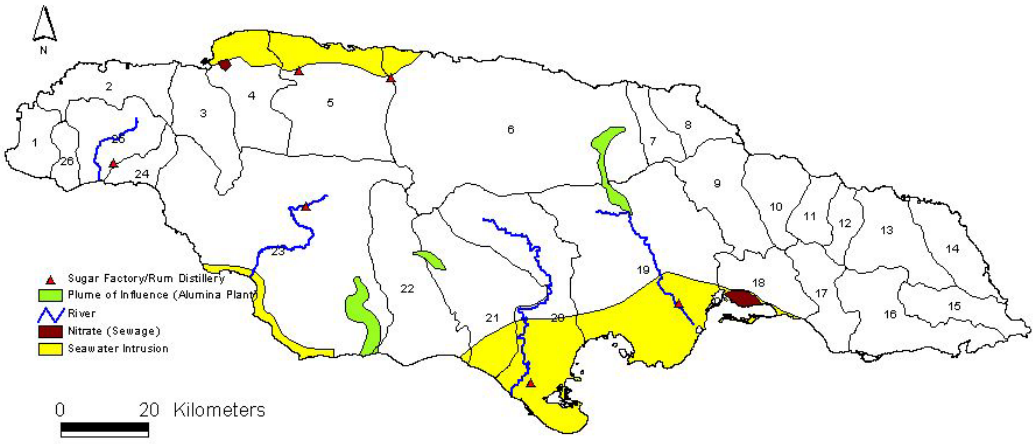


Figure 3.7: River Basins into Which Jamaica is Divided and the Aquifers that Have Been Compromised by Industrial Effluents



Measurements of water quality in selected wells, rivers and springs between 1996 and 1999 show exceedances of water quality standards for irrigation, industrial use, recreation and ambient water quality standards (see Tables 3.2 and 3.3).[12]

Table 3.2 shows that water from the wells in the Blue Mountain North, Blue Mountain South, Dry Harbour Mountains and Martha Brae River Basins met the water quality standards for drinking water, irrigation and industrial use. The standard for drinking water was exceeded 9 times in the Kingston Basin, 4 times in the Rio Cobre Basin, 3 times in the Rio Minho Basin, and in once in the Black River Basin. The ambient water quality standard was exceeded in samples from wells in all basins except Kingston, with most exceedances occurring in the Rio Cobre (23) and Rio Minho (26) basins. The industrial water quality standard was exceeded most often in the Rio Cobre Basin followed by the Cabarita River and Kingston Basins.

Water quality in rivers and springs (Table 3.3) show that ambient and recreational water quality standards were exceeded in all basins except for the Martha Brae River Basin, which met the ambient water quality standards.

Table 3.2: Water Quality in Selected Wells in Jamaica

Basin	Data year	No. of wells	Number of exceedances of water quality standards for				Comments on exceedance of ambient standards
			Drinking water	Irrigation	Industrial	Ambient water	
Blue Mountain North	1996 - 99	3	—	—	—	3	Excess sodium or sulphate
Dry Harbour Mountain	1995 - 97	7	—	—	—	4	Excess nitrate
Martha Brae River	1996 - 99	6	—	—	—	4	Excess sodium, chloride, nitrate or TDS
Great River Basin	1990 - 98	6	—	—	6	6	Excess calcium, sodium chloride or nitrate
Cabarita River	1990 - 98	7	—	—	3	5	Excess calcium, chloride or sulphate
Black River	1990 - 98	19	1	—	—	12	Excess sodium, nitrate or sulphate
Rio Minho	1990 - 98	27	3	—	1	26	Excess calcium, magnesium, sodium, chloride, nitrate, pH, potassium, sulphate, conductivity, hardness or 105 sodium, chloride, sulphate.
Rio Cobre	1990 - 98	23	4	—	14	23	Excess calcium, magnesium, sodium, chloride, nitrate, phosphate, sulphate, conductivity, hardness or TDS.
Kingston	1990 - 98	12	9	—	4		
Blue Mountain South	1995 - 98	4	—	—	—	4	Excess sodium, chloride, sulphate, conductivity or TDS.

[12] Source: Claude Davis & Associates. *Technical Support Document For The Regulatory Impact Analysis For Trade Effluent And Industrial Sludge Regulations.* Prepared for the National Environment and Planning Agency (NEPA). April 2004.

Table 3.3: Water Quality in Rivers and Springs

Basin	Data years	No. of springs & rivers	Number of exceedances of water quality standards					Comments on exceedance of ambient standards (b)
			Drinking water	Irrigation	Industrial use	Recreation	Ambient water	
Blue Mountain North	1996 - 99	21	—	3	1	20	15	Excess sodium, sulphate or hardness
Dry Harbour Mountain	1995 - 97	20	1	1	3	15	13	Excess sodium, sulphate, chloride, nitrate, TDS
Martha Brae River	1996 - 99	3	—	—	—	3	—	
Great River	1990 - 98	15	—	1	—	14	6	Mainly excess sulphate and TDS
Cabarita River	1990 - 98	19	2	1	3	16	10	Excess sodium, sulphate, TDS
Black River	1990 - 98	9	—	—	3	6	6	Excess sulphate, TDS
Rio Minho	1990 - 98	23	8 (a)	4	7	19	17	Excess TDS, BOD (c), sodium, chloride, sulphate
Rio Cobre	1990 - 98	24	1	—	2	22	19	Excess sodium, nitrate, sulphate, BOD (c)
Kingston	1990 - 98	18	1	3	2	16		
Blue Mountain South	1995 - 98	15	—	1	1	6	15	Most frequently excess sulphate, sodium, TDS, hardness

(a) All have excess chloride, several also sodium, TDS.
(b) Some rivers and springs lack certain measurements. The true number of exceedances could therefore be somewhat larger than indicated.
(c) BOD measurements have not been taken in most other rivers and springs in this table.

The exceedances in the various basins are accounted for by one or more of industrial effluents, saline water intrusion, or the presence of microbial organisms.

Most surface waters fail to meet the recreational water quality standard because of microbial organisms evidenced by high levels of coliform which indicate faecal contamination from humans or animals.

Runoff from rainfall carries nutrients and sediments that are discharged via dry gullies and rivers into Kingston Harbour and other bays and coastal waters. Agricultural runoff and discharges from unsewered households contribute to nutrient loading and coliform contamination of rivers and coastal waters. The *Jamaica Survey of Living Conditions 2002*[13] estimates that only 21.2% of households are sewered while the remainder either have soak away pits or pit latrines. The consequences of unsewered disposal are high nitrate levels especially in the Liguanea Plains in Kingston/St Andrew and coliform contamination of some rivers and streams.

High levels of biological oxygen demand (BOD), which are indicative of organic pollution, are also found in most rivers with especially high levels in the Elim River. In the latter case, agro-processing wastes were identified as the cause and intervention was shown to reduce BOD levels. Wastes from sugar factories are high in BOD and account for high BOD levels in the Rio Cobre and Rio Minho.

[13] Planning Institute of Jamaica. *Jamaica Survey of Living Conditions 2002.* 2002

Red mud, the industrial effluent from processing bauxite into alumina, accounts for levels of sodium and sulphate in the Rio Cobre, Black River and Dry Harbour Mountain basins that are above background levels. Water quality and hydrogeological studies in the Essex Valley have shown extensive contamination of groundwater resources from alumina operations. Improved red mud disposal practices have resulted in some improvement in the quality of groundwater in the vicinities of some alumina plants. Model predictions suggest that sodium and sulphate levels in groundwater will decline over the next 25 years due to better waste disposal practices and improved and sustained management of groundwater resources.

The contamination of water resources by human activity is being addressed in part by sewage effluent regulations and other initiatives designed to reduce the amount of sewage disposal in soak away pits and to improve water quality in effluent from sewage treatment plants.

Contaminants of concern in sewage sludge and agricultural wastes are nitrates, phosphates and pathogens. When applied to soil, sewage sludge provides an excellent soil conditioner and source of nutrients. However, pathogens in sewage sludge can enter ground water and can threaten water supplies, and an excess of nutrients can lead to eutrophication and eventually loss of aquatic life. At present in Jamaica there is no data to link the application of sewage sludge to soils with high nutrient levels in groundwater or to eutrophication. However, the sewage sludge regulations are designed to provide management of sludge to avoid such problems.

3.4 RELEASES TO THE ENVIRONMENT: SOLID WASTES

"Solid waste" (municipal, commercial and industrial) is nearly always cited as one of Jamaica's pressing environmental problems. Eight municipal waste disposal sites are in operation across Jamaica but none meet all of the generally recognised criteria to qualify as a landfill site. There are no proper facilities for the disposal of hazardous waste. Medical waste is currently separated (to some degree) and disposed of in "incinerators", few of which would likely meet the recently enacted air quality regulations.

3.4.1 Municipal Waste Collection

The collection of municipal waste is organised by four regional offices of the National Solid Waste Management Authority (NSWMA), each of which serves a wasteshed comprising two or more parishes. NSWMA's responsibilities under the NSWMA Act include the licensing private solid waste management companies, collection vehicles and disposal site operators; contracting municipal garbage collection; and operating of disposal sites.

The *Survey of Living Conditions* reports that 48.2% of Jamaican households have some form of garbage collection (regular, irregular and private). The collection and management of municipal waste for disposal at NSWMA sites is limited by several factors including:

- Unreliable and inadequate fleet of trucks for collection
- Inaccessibility of some rural and urban areas for collection due to the presence of informal (often inaccessible) settlements and lack of security for collection personnel
- Alternate and inappropriate disposal means (it is estimated only 70% of garbage generated is collected by NSWMA with the remainder burnt or otherwise disposed of in gullies or waterways).

The consequences of these factors include discharge of considerable quantities of debris in Jamaica's coastal waters, especially after heavy rainfall. In Kingston Harbour this is exacerbated by untreated sewage.

Various initiatives are underway to collect or recycle some categories of waste such as:

- Cell phones
- Car batteries (limited basis for several years)
- Newspaper
- PET bottles
- Cardboard
- Clear & green glass bottles
- Print cartridges
- White waste (fridges etc.)
- Waste oil (collect for reuse)
- Annual beach cleanup (some beaches).

For most of these categories, the extent of these efforts is limited, affecting only a portion of total wastes in the category.

3.4.2 Hazardous Wastes

There is limited information on the quantities of hazardous waste generated in Jamaica and on the risks to the environment posed by generation and disposal. The major categories of hazardous wastes and the sectors in which they are generated are given in Table 3.4.[14]

Sites contaminated with red mud, lead (from backyard smelting of lead acid batteries and from an abandoned lead mine), and asbestos (from improper disposal of asbestos pipes) have been documented and it is also likely that there are sites contaminated with oil and other petroleum products, PCB contaminated transformer oils, and pesticides. Recently and previously closed municipal dumps are potentially contaminated sites and should be evaluated.

Apart from red mud from alumina processing which is stored in various types of pond systems, the majority of hazardous wastes are disposed of at the Riverton City municipal waste disposal site or at other regional disposal sites. In some cases, selected types of waste are stored or landfilled on the site where they are generated (cement kiln dust, asbestos), or consolidated and exported for treatment (some spent refinery catalysts). Some PCB wastes have been exported for treatment/disposal overseas.

The most recently constructed red mud ponds use a recirculation system in which some of the liquid caustic is reused in the plant. Water balance calculations and groundwater monitoring clearly indicate leaching from red mud ponds into the groundwater or in some cases accidental discharge to surface waters. Liquid hazardous wastes are presumably discharged to gullies, sewers/sewage treatment plants and surface waters.

[14] Source: Claude Davis & Associates. *Policy and Policy Framework for Hazardous Waste Management in Jamaica: Final Report.* Submitted to Ministry of Land and Environment. 2003.

The Riverton City site and all other solid waste disposal sites are not secure landfills since they lack liners or facilities for leachate collection, landfill gas collection, vector control etc. Ideally, disposal of hazardous wastes should occur in special cells in a landfill or in secure hazardous waste landfills.

Table 3.4: Types of Hazardous Waste in Jamaica and Sectors in Which They Occur

SECTOR	HAZARDOUS WASTE TYPE
Chemical Industry	
Inorganic chemicals	Acids, salt, alum powder, caustic, waste oil and alkanes, contaminated drums/containers, pesticide wastes and containers.
Pharmaceutical	Inorganic compounds, organic compounds, alkalis, spent solvents, reactive wastes, toxic metal compounds, aromatic hydrocarbons, expired chemicals and bad batches of products.
Commercial	Circuit boards (computers, electronic appliances), fluorescent lighting fixtures.
Electricity Generation	PCB contaminated transformers. Contaminated sites.
Household	Paints, solvents, used oil, cleaning agents, consumer product batteries, circuit boards (computers, electronic appliances), ballasts from fluorescent lighting fixtures.
Manufacturing	
Paint Industry	Spent oily residues, flammable sludge/solid waste, paint sludge, solvents, drums/containers, caustic soda
Tannery	Inorganic acids, organic acids, inorganic compounds, alkalis, spent solvents, reactive wastes, toxic metal compounds, fuel/ oil/ grease, used batteries.
Mineral processing	
Alumina extraction	Alkali sludge/red mud, waste lube oil, transformer oils, asbestos, PCBs, fuel/oil/grease and batteries, sludge from digesters.
Cement	Kiln dust, waste oils, waste chemicals.
Petrochemical Industry	
Petroleum refining	Petroleum refining industry wastewater containing benzene and other hydrocarbons, spent catalysts, batteries, sludge from refining processes, oily components (filters, rags), lube oil sludge, lab lubricant samples and solvents. Oil and/or petroleum products contaminated sites.
Petroleum products marketing & distribution	Sludge from the storage of petroleum products, batteries, waste oils, grease and lubricants. Oil and/or petroleum products contaminated sites.
Service Sector	
Photographic Processors	Liquid containing silver residue, used film, thiosulphates.
Drycleaners & Laundromats	Solvent, contaminated drums/containers, perchlorethylene sludge.
Agriculture **Sugar Industry**	Waste pesticides, agricultural chemicals, used oils, lubricants, cleaning/household chemicals.
Transportation	
Aviation	Filter monitors, engine oil, water detector capsules, oily saw dust, storage tank sludge. Oil contaminated sites.
Marine	Bunkering – contaminated fuel, expired fire fighting foam, sludge Stations – sludge, batteries, oil, liquid oily waste, medicaments and chemicals, hazardous household wastes.
On and off road vehicles	Lead acid batteries, battery casings, vehicle operating fluids (used oils, lubricants and fluids) solvents, thinners, reducers, brake cleaning spray and glycol, CFCs from air conditioning. Oil and/or petroleum products contaminated sites.

SECTOR	HAZARDOUS WASTE TYPE
Other	
Hospitals/clinics	Medical waste.
Asbestos contaminated sites or buildings with friable asbestos	Asbestos materials.
Incineration, trash burning	Air emissions of dioxins/furans, ash.
Various government and private sector entities	Buried chlorine cylinders, expired pharmaceuticals, old/unwanted chemicals, pesticides, abandoned/unclaimed imports of chemicals.

3.4.3 Medical Waste

The current status of medical waste management in Jamaica can be summarised as follows:

- There is no specific legislation in place for the management of medical waste
- There are not enough facilities with appropriate technologies for treating and disposing of medical waste (e.g., incinerators with emission control technology or other appropriate treatment technologies that meet emission standards)
- There are no sanitary landfills for final disposal of treated medical waste
- There is limited data on the quantities of medical waste that are generated, incinerated or sent for final disposal
- Transportation methods for medical waste (on-site and off-site) leave room for risk of injury or contamination
- The labelling, storing and handling of medical waste at all stages of the cycle is inadequate
- There is a low level of knowledge among waste handlers and treatment facility operators on the safe handling of medical waste
- There is no isolation system in morgues and mortuaries; body waste goes either to the sewerage system or to the municipal disposal sites which are not appropriately designed with environmental control features to accept such waste.

3.5 LAND USE PRESSURES

Jamaica's geography is dominated by an east west oriented mountainous backbone bordered by narrow coastal plains. The dominant economic activities -- tourism, mining and agriculture -- are supported by and rely on natural assets, most of which are located in the coastal zone (except for bauxite mining and some agriculture in interior valleys). As a result, much economic activity is concentrated in or adjacent to the coastal plain areas, which are less than about 3 km wide on the north coast and broader on the south coast, especially in the parishes of Clarendon and St. Catherine. This overall pattern of concentration is particularly pronounced in the urban areas, with 52.0% of the population in 2001.

Although these factors tend to focus land use pressures in coastal and urban areas, land use issues in fact arise across the island. Additional contributing factors include population growth in vulnerable areas, limited availability of affordable and accessible land for low-income earners, poor agricultural and forestry practices, badly managed development and road construction projects, and human encroachment into forest reserves and protected areas. These land use pressures result in environmental degradation including the types of environmental releases

discussed in previous sections, exacerbation of erosion and flooding, degraded and diminishing wetlands, compromised water resources, and deteriorating coral reefs.

For example, according to the draft *Watershed Policy*[15] for Jamaica, landslides and slope failures are common in the non-limestone watersheds due to the presence of steep slopes, thin or erosive soils, and heavy rains. These natural conditions of instability are aggravated by human activities such as unsuitable farming practices, large scale removal of trees from watershed areas, unapproved and informal quarrying, housing programmes, and squatter settlements.

With respect to forests, the most recent assessment of forest cover in Jamaica was completed in 1998. This assessment classified about 30 percent of the country as forest (approximately 336,000 hectares). According to the *National Forest Management and Conservation Plan,*[16] the majority of this forest land has been disturbed and degraded, and only about 8 percent of the island remains as natural forest showing little evidence of human disturbance. The *Plan* notes that forests are threatened by industrial, agricultural and urban development. Approximately 110,000 hectares of land are designated as forest reserves, but over one third of forests in reserves or other protected areas have been significantly disturbed by human encroachment. Notwithstanding these facts, in the 10-year period prior to 1998 the cumulative loss of forested land in Jamaica was less than 1% (3064 hectares).

Over this same 10 year period, bauxite-related land use increased by about 5000 hectares, the largest increase among land use categories. Restoration of mined out quarries and bauxite mines has not kept pace with planned and required schedules. The extension of mining operations, land areas required for dry stacking of red mud, and use of agricultural or forested areas for housing and other development projects will create additional land use pressure and associated challenges (such as maintenance of biodiversity and watershed protection). Current proposals concerning bauxite mining in the Cockpit Country are emerging as a major policy issue, driven by stakeholder concerns about impact on a unique and significant biophysical environment that lacks protected area status, and impact on the Maroon communities of the area.

3.6 NATURAL RESOURCE USE

Jamaica's natural resources are a part of the country's heritage and an important foundation for future prosperity. Key economic sectors are dependent on natural resources – especially mining (bauxite and alumina industry, limestone), agriculture and tourism. But use of natural resources can be an environmental stressor, directly and indirectly affecting the resource base itself.

For example, vulnerable biological resources show the impacts of resource use and other environmental stressors:[17]

- Jamaica has a particularly high proportion of endemic plant and animal species and ranks fifth among the world's islands with respect to percentage of endemic flora. However, 14 endemic animal species and 200 endemic plant species are classified as critically imperilled or vulnerable to extinction.

[15] Natural Resources Conservation Authority. *Draft Watershed Policy*. 2000. Available at www.nrca.org/policies

[16] Forestry Department. *National Forest Management and Conservation Plan.* Undated.

[17] Except as noted, the source for all data in this section is: Statistical Institute of Jamaica and National Environment and Planning Agency. *Jamaica's Environment 2001*. October 2001.

- Coral reefs are one of the foundations for tourism and present a protective barrier against storms, and are sources of food, employment, and recreation. However, Jamaica's coral reefs have declined significantly. On fringing reefs around the island, mean coral cover at 10-meter depth declined from 52% in the 1970s to 3% in the 1990s. Although deeper reefs are in better condition, overall decline of the reefs is a major concern.

- Mangroves, salt marshes, and other wetlands are important habitats and breeding and nesting areas for birds and aquatic life. The area of wetlands and mangrove forest remained essentially stable over the period 1989-1998, but this does not reflect the state of the these resources (which are under pressure due to harvesting of mangrove, competing uses, and other stressors).

- Available fish stock data is limited. However, Jamaican waters, which support an active fishery, are now said to be the most over-fished in the English-speaking Caribbean.[18]

3.7 ENERGY DEVELOPMENT AND USE

Jamaica's energy is provided primarily by heavy fuel oil (56.7%), diesel (16.9%) and gasoline (17%). All numbers are based on 2005 data.[19]

Jamaica's non-renewable energy resources are limited to unused peat deposits, although an intensive off shore oil exploration program is under way. Jamaica is therefore heavily dependent on imported fuels, lubricants and other petroleum products.

Renewable energy sources now provide only 4.8% of energy consumption, of which wind and hydropower – the non-polluting forms of energy - comprise just 0.45% of the total (the balance being charcoal, fuel wood, and bagasse). Efforts to use locally produced ethanol as an oxygenate and octane enhancer in gasoline and to increase the use of solar energy, biogas and photovoltaic devices may help reduce petroleum dependence over time.

The consumption of energy is dominated by bauxite and alumina processing (36.3%), electricity generation (23.8%) and transportation (22.4%). Since 2000, energy end use has increased most rapidly for bauxite & alumina processing (12% increase), electricity consumption (9.4%) and transportation (6.2%).

The on-road motor vehicle fleet increased dramatically after import restrictions were lifted in 1994/1995 and the fleet as of December 8, 2003 was 453,084.[20] Anecdotal evidence points to increased traffic congestion and there are frequent complaints about air pollution due to traffic. Examination of motor vehicles for roadworthiness includes safety and other checks but there are no measurements or assessments of vehicle emissions. Proposed inspection and maintenance programs and associated motor vehicle emission standards have not yet been implemented.

Jamaica's development priorities anticipate growth in the bauxite and tourism sectors and these will inevitably increase demand for electricity and transportation. These in turn will increase

[18] CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP).

[19] Source: Planning Institute of Jamaica. *Economic and Social Survey Jamaica 2005.* April 2006.

[20] Ministry of Transport and Works. *Annual Transport Statistics Report: Jamaica in Figures 2003 – 2004.* Prepared by the Technical Services Unit, Directorate of Policy, Planning & Evaluation.

emissions, all other things remaining equal. However, proposed use of LNG for alumina processing and some electricity generation would reduce SO_2 and PM emissions but likely increase NO_X emissions from these sectors.

As a general observation, Jamaica's search for energy alternatives will inevitably raise important environmental management issues. Construction and ongoing management of LNG facilities requires strong and effectively applied environmental and safety standards. If petroleum exploration is successful and ultimately leads to production, the associated requirements for a strong environmental protection regime will be well beyond what currently is in place in Jamaica. And even ethanol production requires careful attention to issues such as environmentally sound agricultural practices, and management of effluents and wastes from the alcohol production processes.

3.8 NATURAL DISASTERS/HAZARDS

By virtue of location (in an earthquake zone and a hurricane belt), geography, geology, and physiographic features, Jamaica is susceptible to various natural hazards, including earthquakes, hurricanes, floods and landslides. Table 3.5 provides a summary of major natural disasters that occurred in Jamaica between 1900 and 2005.

Table 3.5: Major Natural Disasters in Jamaica from 1900 to 2005[21]

	# of Events*	Killed	Injured	Homeless	Affected	Total Affected	Damage US$ (000's)
Drought	3	0	0	0	100,000	100,000	6,500
avg per event		0	0	0	33,333	33,333	2,167
Earthquake	1	1,200	0	0	90,000	90,000	30,000
avg per event		1,200	0	0	90,000	90,000	30,000
Epidemic	4	46	0	0	300	300	0
avg per event		12	0	0	75	75	0
Flood	13	767	0	53,422	845,290	898,712	1,262,740
avg per event		59	0	4,109	65,022	69,132	97,134
Slides	1	40	0	0	0	0	0
avg per event		40	0	0	0	0	0
Wind Storm	23	574	225	99,420	1,224,516	1,324,161	1,793,912
avg per event		25	10	4,323	53,240	57,572	77,996

* Qualifying entries into the database must satisfy at least one of the following criteria: 10 or more people reported killed, 100 people reported affected, a call for international assistance, or a declaration of a state of emergency

Over the last 25-30 years Jamaica has experienced an increase in the frequency of natural events, (particularly those related to extreme weather), and vulnerability has increased due to factors such as use of marginal lands and environmental degradation. In addition, climate change is expected to expose Jamaica to new threats, including both extreme events and chronic long term change. The balance of this section considers a number of these risks.

[21] Emergency Disasters Database. http://www.em-dat.net/disasters/countryprofiles.php

3.8.1 Earthquakes

The major source zone for earthquakes affecting Jamaica is the Cayman Trench, which parallels Jamaica's north coast. Most epicentres for earthquakes felt in Jamaica are within the Cayman Trench at depths of less than 100km and the more severe shocks originate off Jamaica's northeast coast parallel to the axis of the trench.

On-island faults concentrated in the vicinity of the two largest topographic features -- the Blue Mountains and Santa Cruz/Don Figuerero Mountains and along the Wagwater fault in north-eastern Jamaica -- are also capable of producing locally damaging earthquakes.

The first recorded earthquake in Jamaica was in 1687 and the island experiences an average of about 80 tremors per year as recorded by the Earthquake Unit, UWI. The three most damaging recorded earthquakes occurred in 1692, 1907 and 1993.

The 1692 earthquake resulted in 3,000 dead, destruction and damage to many buildings, liquefaction, fissures, subsidence and landslides. Most of the damage occurred in Port Royal, where 2/3 of the area plunged into the sea. The 1907 earthquake damaged or destroyed 85% of the buildings in Kingston and Port Royal, and resulted in 1,000 dead, fires, broken water mains, landslides and slumps. Losses were estimated at US$30 million (Munich Re, 1998 as seen in KMA Seismic Hazard Assessment, 1999). The 1993 earthquake, which was along the Wagwater belt, resulted in J$200 million in losses, including building damage, landslides, lateral spreading, ground cracks, localized subsidence, submarine slumping, and ground cracks on roadways and on the south-western side of the Mona Reservoir.

Thirteen earthquakes with intensities of MM VII and greater, including the January 1993 event, have been documented among the more than 326 years of recorded earthquakes in Jamaica.

3.8.2 Hurricanes

Table 3.6 summarizes recorded hurricanes that have hit Jamaica since 1492. Of the 66 hurricanes, 26 have caused or may have caused 25 or more deaths.[22]

Table 3.6: Frequency of Storms That Hit Jamaica, 1500 to 2004[23]

Century	Number of Hurricanes that hit Jamaica
1500s	3
1600s	4
1700s	22
1800s	20
1900s	16
2000s	1
Total	66

[22] National Weather Service, National Hurricane Center. *Deadliest Atlantic Tropical Cyclones, 1492 to 1996* http://www.nhc.noaa.gov/pastdeadly.shtml?

[23] Jamaica's Hurricane History. http://www.joyousjam.com/jamaicashurricanehistory/id1.html

Hurricanes result in loss of life and a wide range of damage due to wind, flooding, landslides and storm surge. Some of the largest losses of life have been associated with storm surge, occasionally reaching heights of 20 to 30 feet at the coastline. Jamaica's reefs and beaches have also been severely affected by storm surges associated with hurricanes. Significant damage to beaches and beach property has occurred in areas such as Harbour View, Bull Bay, the Palisadoes, Negril, Bluefields and Long Beach.

In 1998, Jamaica experienced three events that resulted in damage of just under J$200 million. In 2001 Hurricane Michelle resulted in damage valued at 0.8% of GDP and loss of 2.8% of Government revenue and grants. In 2002 damage was valued at 0.7% of GDP. In 2004, Hurricane Ivan resulted in damages of J$35 billion. In 2005, damage due to hurricanes Dennis and Emily was estimated at J$5,976 million, 71.4% of which was for damage to transportation infrastructure.[24]

3.8.3 Flooding and Landslides

Based on data from 1891 to 1998, mean annual rainfall in Jamaica is 1895 mm but is variable. For example between 1951 and 1980 annual rainfall ranged from 1324 mm to 2593 mm. Flooding due to high intensity rainfall associated with various weather systems (storms, hurricanes, cold fronts, frontal troughs) is exacerbated by human activities (poor land use, unauthorised or ill-informed construction in river beds/flood prone areas, blocked drains, etc.).

Flooding has been a frequent event resulting not only in economic loss (damaged infrastructure, crops) but also in increased pollutant loading reaching coastal areas. Some 187 flooding incidents have been reported between 1884 and 2000. Economic losses due to flooding between 1986 and 2005 ranged from US $7.5 million to over US$156 million (See Table 3.7).[25]

Landslides frequently occur with other disasters (flooding, earthquakes). It is often difficult to isolate damages due exclusively to landslides.

Table 3.7: Cost of Flooding in Jamaica

Period	Cost (US $ Million)
1986	42
1995-6	7.5
1998	24
2001	54.8
2002	51.5
2005	156 and counting

[24] Planning Institute of Jamaica. *Economic and Social Survey of Jamaica 2005*. 2005

[25] Carby, B. *Flooding In Jamaica: Are We Making Progress In Anticipation Of Climate Change?* Office of Disaster Preparedness and Emergency Management, Jamaica.

3.8.4 Climate Change[26]

The effects of climate change will amplify many of the natural hazards to which Jamaica is already exposed. In part this is because extreme weather events are likely to become both more frequent and more severe. In addition, as an island state Jamaica is largely dependent upon its coastline, and thus vulnerable to sea level rise associated with climate change. Key infrastructure such as the airport and many industries are located in coastal regions, and tourism is concentrated in the coastal zone. Sea level rise will compound beach erosion in some areas, affecting industries and key infrastructure. The cost to protect Jamaica from a one metre sea level rise was estimated by the IPCCC in 1990 to be US$462 million, a cost of US$197 per person or an annual cost that is 19% of GNP.

Climate change may have already affected the island's coral reefs. The death of large numbers of corals in 1988 and 1990 has been attributed to the increases in the temperature of coastal waters. The economic value of all resources within the coastal zone will be adversely affected in a changing climate and a rising sea level. The resulting impact will be a loss of income, loss of commercial and industrial structures and infrastructure, and in general a detrimental impact on employment and the overall economy.

Raw water supplies are also directly affected by changes in climatic conditions. Changes in the amount of rainfall as well as its frequency and intensity determine the amount of water available for exploitation or domestic supply. The likely changes to Jamaica's total rainfall are uncertain, but even minor changes could have significant impacts on Jamaica's water resources. In addition, sea level rise will directly impact water resources by causing increased saline intrusion in coastal aquifers. Agricultural impacts, such as soil erosion and increased vulnerability to pests, are also anticipated as a result of changing rainfall patterns and changing temperatures.

[26] The text in this section has been adapted from: Government of Jamaica. *Initial National Communication of Jamaica.* Submitted to the UNFCCC Secretariat November 2000.

CHAPTER 4. ENVIRONMENTAL GOVERNANCE IN JAMAICA

4.1 INTRODUCTION

In this chapter we review the environmental governance framework in Jamaica. The information is presented in the following sub-sections:

4.2 Overall Development Policy Framework
4.3 Environmental Policy Framework
4.4 Other Relevant Policies
4.5 Legislative and Regulatory Framework
4.6 Institutional Framework
4.7 International Agreements to which Jamaica is a Signatory
4.8 Civil Society
4.9 The Private Sector.

4.2 OVERALL DEVELOPMENT POLICY FRAMEWORK

The Medium Term Socio-Economic Policy Framework 2004-2007 (MTSEPF)[27]: The Medium Term Socio-Economic Policy Framework is Jamaica's main development policy document. It was prepared by the Planning Institute of Jamaica (PIOJ) in collaboration with the Ministry of Finance and Planning (MOFP) and the Bank of Jamaica (BOJ), with support from the European Commission (EC). It builds on the overarching policy framework established in the 1996 *National Industrial Policy* (discussed later in this section).

The MTSEPF has been described more fully in Chapter 2. As noted in that chapter, Goal #7 of the MTSEPF is to ensure environmental sustainability and to improve national and local capacity for hazard risk management. This goal has 4 strategic objectives:

- Integrate the principles of sustainable development into country policies and programmes
- Reverse the loss of environmental resources
- Formalize the solid waste sub-sector to provide better public cleansing
- Minimize the impact of natural hazards.

National Sustainable Development Framework for Jamaica (Vision 2025)[28]: The Government of Jamaica intends to establish a National Sustainable Development Framework (NSDF) to promote effective mechanisms for achieving sustainable development goals, including the Millennium Development Goals (MDGs). This initiative, called "Vision 2025", will be led by a Sustainable Development Task Force chaired by the Cabinet Secretary. It will have five components:

- Creation of a national vision for development
- Establishment of broad goals and objectives
- Development of strategies and actions
- Provision of an enabling governance arrangement with clear roles and responsibilities
- Identification of a performance measurement framework.

[27] Please refer to the Bibliography for full citations for all government documents mentioned in this Chapter.

[28] Only working documents are currently available: *Scoping Exercise in Preparation of National Sustainable Development Framework for Jamaica* (July 2006) and *Vision Statements and Exercises* (Oct 2006). See Bibliography for full citations.

The Vision 2025 outputs will be used to develop long term objectives within the National Development Plan (NDP) process, described in the following paragraph.

National Development Plan (NDP) 2005-2030[29]: Recognizing that the MTSEPF is a medium-term plan (three years), the PIOJ and the Ministry of Finance have embarked on a long term planning process to develop a National Development Plan with a 25 year timeframe, including a vision for the country in 2030. The NDP process is intended to develop a broad based plan with the overarching goal of achieving "developed country" status by 2030. The NDP will build on the Vision 2025 initiative (see above). This plan will not replace the MTSEPF but will provide the long term planning framework (25 years) for national development under which MTSEPF will continue to be developed with a three year cycle.

Other Policies: Table 4.1 provides a brief summary of a number of other broad policies pertinent to sustainable development in Jamaica.

Table 4.1: Additional Policies Pertinent to Sustainable Development in Jamaica

The National Industrial Policy (NIP) - A Strategic Plan for Economic Growth and Development	This policy was presented to Parliament in March 1996. It was designed to provide a systematic, holistic and comprehensive approach to the development of the country into the 21st century. The NIP presents a strategic plan for four interrelated, mutually reinforcing policy components: 1) macroeconomic policy; 2) industrial strategy; 3) social policy; and 4) environmental policy.
Jamaica 2015 - A Framework and Action Plan for Improving Effectiveness, Collaboration and Accountability in the Delivery of Social Policy	This policy, referred to as the Social Policy Framework (SPF), was produced in 2002 under the guidance of the Human Resource Council. The SPF is intended to provide a guiding framework for social policy in Jamaica up to 2015. This policy outlines a societal vision; a set of key policy goals; objectives for changes in institutional systems and relationships; a framework for assessing progress over time; and a five year programme of action. The fifth goal of this policy calls for "improved environment for quality of life, for Jamaicans living and as yet unborn". It also includes three sub-goals: (1) improved environmental practices in the public and private sectors; (2) increased public awareness and advocacy; and (3) increased protection of our natural resources.
Government at Your Service: Public Sector Modernization Vision and Strategy 2002-2012	This policy document was tabled in Parliament in 2002 as Ministry Paper No. 56. It sets the stage for a more cohesive and long term approach to public sector reform. It covers 8 themes: sustainable development; governance; values, principles and regeneration of the public service; customer service; resource management and accountability; managing people; performance management; and technology. The chapter on sustainable development introduces the principles of an integrated policy-making process, including full cost accounting and collaboration. This chapter identifies five strategies: a national sustainable development strategy to set a unified vision for the country; a planning strategy to provide an enabling planning framework for national development; a policy reform strategy for a more cohesive policy development process; a regulatory strategy to modernize the regulatory framework; and, a greening of government strategy to ensure that government operations assist in the conservation and protection of the environment.

[29] No detailed reference documents are currently available.

4.3 ENVIRONMENTAL POLICY FRAMEWORK

The Jamaica National Environmental Action Plan (JaNEAP) 1999-2002: This document represents the Government of Jamaica action plan addressing environmental issues for the period 1999-2002. This is an update of the first JaNEAP prepared in May 1995; it entails a comprehensive overhauling of the original document with major emphasis on setting new directions and new actions. It is intended to continue the process of addressing the commitments undertaken by the Government of Jamaica towards AGENDA 21 and the Small Island Developing States (SIDS) Programme of Action. A new JaNEAP is being drafted and will cover the period 2007-2009. The first draft was expected in December 2006.

At present the JaNEAP is the main feature of the environmental policy, plan and programme framework in Jamaica. In the absence of an overarching environmental policy, this plan is guided by various environmental and related policies such as the Policy for Jamaica's System of Protected Areas, the Land Policy, and the Draft Watersheds Policy (discussed below). The JaNEAP presents the practical actions to which the Government is committed and it identifies the organizations responsible for implementing those actions. Future JaNEAPs ideally should be guided by both a sustainable development policy and an environmental policy.

The JaNEAP 1999-2002 reinforced the concept of integrated environmental and economic policy tools such as the polluter pays principle and the user pays principle. It also reflected a shift from command and control measures for pollution control to a more self-regulated approach involving pollution prevention and elimination of waste through the use of Environmental Management Systems (concepts that were introduced in the NIP). The JaNEAP outlines the environmental issues facing Jamaica, provides an overview of the progress made over the previous three years towards addressing these issues, gives a vision of the way forward, and presents a plan for the main actions to be undertaken between April 1999 and March 2002.

The National Environment and Planning Policy and Strategy (NEPPS): In 2001 the National Environment and Planning Agency (NEPA) was established, as discussed in Section 4.6 below. At this time, NEPA initiated the development of a National Environment and Planning Policy and Strategy (NEPPS). The intent was to establish a common policy foundation for all matters dealing with planning and environmental management and to provide clear policy directions to all agencies, Parish Councils, the private sector and the general public for matters related to land development, development planning, and environmental management. A policy gap analysis was conducted in 2003 as part of the process to develop the NEPPS. However since 2003 no further development of the NEPPS has been undertaken.

Strategic Environmental Assessment (SEA) Policy: Recognizing that environmental issues were not incorporated in most policy-making processes within GoJ, the Cabinet Office commissioned a review of the integration of environmental considerations into the Government's decision-making machinery in 2001. This review was followed by the development of a Strategic Environmental Assessment (SEA) policy which was approved by Cabinet in 2005 as a Cabinet Directive. This policy aims at changing attitudes towards environmental protection and policy coordination, tightening the rigour of the policy-making process, and increasing the accountability of officials and ministers for the environmental implications of their decisions.

The SEA policy statement is as follows: "*As part of Government of Jamaica's commitment to sustainable development, the GoJ will ensure that all its policies, plans and programmes geared towards national development, adequately consider potential environmental effects and impacts and where these are adverse, incorporate appropriate measures to reduce or eliminate these effects and impacts*". Under this policy, an SEA is required for any policy, plan or programme that would affect the natural resources and/or will have important environmental implications.

National Land Policy: The National Land Policy was adopted by the Government of Jamaica in July 1996. This policy recognizes that the most valuable and finite resource is land and seeks to establish the framework for the proper planning, management, development and use of land. It sets out specific policies, strategies, plans, programmes and projects relating to:

- Land information management systems
- Land use and land resources
- Land titling, land tenure and access
- Acquisition, pricing and divestment of government-owned lands
- Taxation and incentives for property development
- Environment and disaster management
- Legislation
- Institutional framework and reform.

However, the overriding policy goal of the National Land Policy has not been translated into a series of objectives and key principles of land management which provides a broad framework for harmonization of each of the above-mentioned eight areas. Furthermore, the policy did not define and assess the various institutional and mechanical elements which constitute a land management system and which have a significant impact on the functioning of land markets.

Thematic Policies*:* In order to protect the environmental resources in Jamaica, a series of thematic policies exist. However, most of these policies remain as "green papers"[30] or in draft form; only three thematic policies are in "white paper" form (finalized). The main thematic policies are:

- National Policy on Ocean and Coastal Zone Management, 2000 (white paper)
- Policy for Jamaica's System of Protected Areas, 1997 (white paper)
- Forest Policy 2001 (white paper)
- Beach Policy for Jamaica: a policy for the use of the foreshore, beach and floor of the sea, draft 2000 (green paper)
- Towards a Watershed Policy for Jamaica, 2001 (green paper)
- EMS Policy and Strategy, 2000 (green paper)
- Coral Reef Protection and Preservation Policy and Regulation, 1997 (draft)
- Mangrove and Coastal Wetlands Protection Draft Policy and Regulations, 1998 (draft)
- Mariculture Policy and Regulations, 1997 (draft)
- National Policy for the Conservation of Sea Grass, 2001 (draft)
- National Solid Waste Management Policy, 2000 (draft)
- Sewage Connection Policy, 1999 (draft).

[30] As per the policy development process, "green paper" refers to a draft policy that has been submitted to the relevant Cabinet Committee, incorporating public consultation results if needed. "White paper" refers to a policy ratified by Cabinet.

***Thematic Action Plans**:* In addition to the policies above, Jamaica has a few environmental thematic action plans under implementation. Table 4.2 presents a number of these Action Plans.

Table 4.2: Thematic Action Plans

National Environmental Education Action Plan for Sustainable Development (NEEAPSD)	This action plan was developed by the National Environmental Education Committee (NEEC) with the support of the ENACT programme. It was launched in 1998 following a participatory planning process that involved over 300 citizens. This action plan is a national framework incorporating environmental education for sustainable development into all aspects of Jamaican life; it targets five programme areas: teacher professional development; curriculum development and implementation; community learning; national public awareness; resources and the sharing of good practices.
Jamaica Coral Reef Action Plan (JCRAP) - 1998	This action plan builds on the International Coral Reef Initiative (ICRI - 1995) and on the Tropical Americas' Agenda for Action formulated in Montego Bay, Jamaica (1995). These were intended to mobilize governments and the wide range of other stakeholders whose actions are required to sustain these fragile resources and the communities who depend on them. This JCRAP is the local response to protect Jamaica's coral reefs.
Towards a National Strategy and Action Plan on Biological Diversity in Jamaica – 2001	Jamaica ratified the UN Convention on Biological Diversity (UNCBD) in January 1995, and this action plan is the instrument developed under the leadership of NEPA to implement its obligations. It was finalized in 2003 and is guiding the national efforts for the conservation and the sustainable use of Jamaica's biological diversity and resources.
Jamaica's National Programme of Action (NPA) for the Protection of the Coastal and Marine Environment from Land Based Sources and Land Based Activities – 2005-2010	As a response to the United Nations Environment Programme (UNEP) - Intergovernmental Conference to adopt a Global Programme of Action (GPA) to protect the marine environment from land-based activities, Jamaica developed this programme of action to address land-based sources and activities (LBS/LBA) of marine and coastal degradation by providing an integrated management framework that enables all relevant national and local actors to reduce environmental degradation and habitat damage.
National Forest Management and Conservation Plan - 2001	The purpose of this plan is to promote and improve the conservation and sustainable use of the forest resources of Jamaica to meet local and national needs through protecting, managing and restoring the resource. It is presented in three parts: Part I provides background information. The environmental and economic values of forests to society are presented in Part II together with the goals of the forestry sector. Part III provides recommendations for implementation, including strategies, activities, projects and budgets.
Ocean and Coastal Zone Management Action Plan	This action plan is the implementation instrument of the general directions set by the policy on ocean and coastal zone management.
National Physical Plan – 1978-1998	This plan is now outdated, although many of its objectives and principles remain valid. There is a need to develop new policies, physical plans and policy instruments that support the best possible land use and sustainable management of land resources. Policies and tools to prevent uncontrolled urban sprawl, loss of good agricultural lands, squatting, and agricultural development in ecological sensitive areas require particular attention.

4.4 OTHER RELEVANT POLICIES

The Master Plan for Sustainable Tourism (2001-2010): Started in 1997, this plan represents the sectoral policy framework to guide development of the tourism sector in Jamaica. It seeks to move the tourism sector on the path of long term sustainability. The plan has five key objectives, including environmental sustainability.

The plan predicts significant growth in visitors and in visitor expenditures over the 10-year period. The expected growth in number of rooms is 4% per annum. Over the 10 year period, this aggressive growth "*can only be sustainable if the necessary infrastructure and environmental protection measures are in place*".[31] While the growth is expected nationally, the three main tourism centers (Montego Bay, Ocho Rios and Negril) are expected to experience the major portion of this growth. The policy states that concentration of accommodation in these three centres will allow for better use of resources and managing environmental impacts.

Several recommendations for environmental sustainability are proposed in the plan:

- Invest to improve water quality and coral cover in the three major resort centres.
- Provide up to US$500,000 to the marine park trusts to help them improve environmental protection and operate new facilities. Ensure that smaller resorts are given the same kind of support to develop marine parks or other environmental efforts.
- Support the National Water Commission's sewerage schemes in the resort centres.
- Work with accommodation and attraction operators to establish self-regulating systems for complying with planning and environmental guidelines.
- Increase the availability of "how-to" information on energy conservation, recycling water and solid waste, use of alternative detergents, and use of solar energy, etc.
- Provide a matching grant facility to help tourism ventures with environmental audits and technical support.
- Collaborate with the Natural Environment and Planning Agency on environment and social impact assessments when tourism facilities are being considered.
- Implement a modified version of the Beach Policy recommended by the former Natural Resource Conservation Authority.

In addition, the ministry of tourism is leading a few initiatives such as the introduction of environmental management principles in the Tourism Board Act and its related Regulations, and a policy proposal for the recreational use of rivers. In May 2005 the Tourism Enhancement Act was passed and sets a "user fee" of US$10 on all plane tickets coming to Jamaica and US$2 per cruise passengers stopping over in Jamaica. These fees will constitute a pool of funds to be used to enhance the tourism products.

The Jamaica Energy Policy - 2006-2020: This policy (green paper) will replace the Energy Policy promulgated in 1995. The original policy achieved several of its established objectives, but there were weaknesses in the areas of diversification from fuel oil, expansion of renewable energy, and sustained improvements in energy conservation. This new policy was formulated to increase efficiencies, reduce energy costs, ensure diversification, reverse the deterioration in energy intensity in the non-alumina sector, whilst enhancing the environment. The policy provides a set of recommendations for an extensive list of energy related policy issues (34) in the

[31] http://www.jsdnp.org.jm/susTourism-masterPlan.htm

areas of energy supply and security, petroleum industry, petroleum tax, electricity sector, rural electrification, transport sector, development of renewable energy resources, energy conservation and efficiency, energy fund and institutional arrangements.

Rural Development Policy: This policy was drafted in May 2004. It articulates a vision for rural development based on citizen participation, social stability, economic viability and environmental sustainability. The strategic goal of the policy is to promote comprehensive and integrated actions towards improving living conditions for rural residents. Objectives include rural economic diversification, planned and orderly development and citizen participation. The policy proposes actions for achieving five goals:

- Promote growth in rural areas while protecting the environment
- Promote and facilitate investment in services and infrastructure
- Build more effective, integrated and participatory processes for rural development
- Support the development of human and social capital
- Focus attention on eradicating poverty and promoting social inclusion in rural areas.

4.5 THE LEGISLATIVE AND REGULATORY FRAMEWORK

Natural Resources Conservation Authority (NRCA) Act 1991: Environmental legislation in Jamaica has tended to be resource-specific (forest, water, wild life, etc.). Partly as a result, the legal framework for environmental protection includes almost 100 pieces of legislation.[32] However, some integration in the management of these resources was achieved when the government of Jamaica passed the NRCA Act (1991).

The NRCA Act is the overriding legislation governing environmental management in Jamaica. It provides for the management, conservation and protection of the natural resources of Jamaica. The Act establishes the Natural Resources Conservation Authority, a body of persons appointed by the Minister of the Environment. The functions of the Authority include taking such steps that are necessary to ensure the effective management of the physical environment of Jamaica and the management of marine parks and protected areas.

The NRCA Act can be considered as a "*horizontal*" legislation instrument within the environmental legislation framework in Jamaica. It cuts across different environmental subject areas. It provides for methods and mechanisms aimed at improving decision-making such as the creation of the NRCA, the environmental impact assessment (EIA) process, and the issuing of permits and licences.

Section 9 of the Act creates a Ministerial discretion to declare parts of or the entire island a "prescribed area", which specified activities require a permit, and may require an environmental impact assessment (EIA). Pursuant to this Section 9, the Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order was passed in 1996 and it provides that the entire island of Jamaica is a prescribed area and lists specified categories of enterprise, construction or development that require a permit. The Permits & Licensing Regulations were passed in 1996.

[32] For a comprehensive reference to environmental legislation in Jamaica, refer to: National Environment and Planning Agency/ ENACT Programme. *Judicial Symposium 2003 CD*. 2003.

Some specific sections related to permits and EIAs are:

- Section 10: Empowers the NRCA to request EIAs for the construction of any enterprise in a prescribed category.
- Section 12: Addresses the potential for contamination of water resources by trade effluent and sewage discharges.
- Section 15: Addresses the implementation of stop orders and fines associated with the pollution of water resources.
- Section 16: Authorizes the NRCA to intervene in order to prevent the contamination of water resources.
- Section 17: Authorizes the NRCA to request in writing, any information pertaining to pollution control facilities such as any sewage treatment plant, industrial waste treatment facility, etc.

Under the NRCA Act, regulations were developed for air emissions in 2005 and are being developed for sewage and trade effluent discharges. Under these new regulations the polluter pays principle is incorporated.

Town and Country Planning (TCP) Act 1958: The TCP Act is the principal legislation governing land use decisions in Jamaica. It was passed in 1958 and is based primarily on the English Town and Country Planning Act of 1947. The last amendments to this Act were made in 1999. It is administered by the Town and Country Planning Authority through NEPA. The overall purpose of the TCP Act is to ensure orderly and harmonious development and to avoid illegal and unsuitable use of land, which may eventually result in undesirable and dysfunctional settlement patterns.

The TCP Act requires the preparation and implementation of Development Orders for the management and control of land use decisions, whether for towns, parishes, special topics or geographical areas. Development Orders prescribe the type of development which may take place and are the basis for granting planning permission in the area to which the order relates.

The fundamental challenge in the last few years has been the ability of the TCP Authority to provide and institute updated Development Orders. Currently Development Orders do not cover all areas of Jamaica; therefore, in the areas with no Development Orders planning control cannot be legally enforced. Of the 16 Development Orders and provisional Development Orders currently promulgated in Jamaica, a number were developed the 1960's, including the Kingston Development Order, and only the St. Ann Development Order of 2000 is recent. Currently five Development Orders are being prepared: Trelawny, Portland, Manchester, Negril and KSA.

From the late 90's, Parish-based sustainable development plans have been under development through the Parish Councils and the Parish Development Committees (PDCs). Although the TCP Act does not make provision for sustainable development plans, or development plans in general, the preparation of development plans forms the intermediate stage to the preparation of Development Orders. The Development Order, not the Development Plan, forms the legal basis for enacting development control measures. Therefore, the distribution and density structure of settlements is dependent on an updated, well-structured and effectively implemented Development Order.

Land Development and Utilization Act 1966: This Act authorizes the Land Development and Utilization Commission to designate any land as agricultural land, if its "situation, character and other relevant circumstances" should be brought into use for agriculture. The Act is not applicable to land approved under the Town and Country Planning Act for development purposes other than agriculture. A weakness of the Act is that it does not take into account the ecosystem services provided by some lands.

Additional Legislation: Table 4.3 presents additional legislation relevant to environmental management and planning in Jamaica.

Table 4.3: Additional Legislation

Other Environmental Legislation	In addition to the NRCA Act, there are various pieces of legislation that address the management of natural resources in Jamaica. The main pieces of legislation in effect are listed below: • Endangered Species (Conservation & Regulation of Trade) Act, 2000 • Beach Control Act, 1956 • Wildlife Protection Act, 1945 • Watersheds Protection Act, 1945 • Natural Resources (Marine Parks) Regulations, 1992 • Natural Resources Conservation (Blue and John Crow Mountains) National Parks Regulations, 2003 • Water Resources Act, 1995 • Fishing Industry Act, 1976 • Forest Act, 1995 • National Solid Waste Management Act, 2001
Other Development Planning Acts	In addition to the Town and Country Planning Act and the Land Development and Utilization Act, numerous other acts relate to development control in Jamaica. The main Acts are: • The Parish Council Act, 1901 • Rural Agricultural Development Authority Act, 1990 • Jamaica National Heritage Trust Act, 1985 • National Water Commission Act • Public Health Act, 1985.
Information Access Act	This Act was passed in June 2002 and entered into effect in 2003. It gives the people of Jamaica a general right of access to official government information which would otherwise be inaccessible. Furthermore, under the Act, certain information will not be subject to disclosure in order to protect essential public interests and private rights. The Act aims to reinforce fundamental democratic principles vital to: improved, more transparent government; greater accountability of government to its people; increased public influence on and participation in national decision making; and knowledge of the functions of government. The Act signals a departure from a culture of secrecy surrounding government and its day-to-day activities.

4.6 INSTITUTIONAL FRAMEWORK

The institutional framework in Jamaica offers a number of "points of entry" through which environmental governance can in principle be exercised. These points of entry include:

- The political/legislative arm of government, including Parliament and Parliamentary Committees, Cabinet and Cabinet Committees, and certain boards with mandated quasi-legislative functions
- The Judiciary, with roles in criminal proceedings, civil legal action, and judicial reviews
- The public service, including the various ministries and agencies, and independent bodies such as the Auditor General and the Public Defender (ombudsman)
- Local government.

This section briefly reviews a number of these organizations, focussing on Cabinet, selected ministries and agencies, and local government.

***Cabinet*:** Under the Constitution of Jamaica the Cabinet is the principal instrument of policy and is charged with the general direction and control of government. The Prime Minister and other Ministers are appointed to serve in the Cabinet and are assigned responsibility for various subjects and departments of Government. Ministries are established to provide the requisite support to Ministers to plan and implement policy decisions. Planning and implementation of Government policy is also undertaken by statutory bodies falling under the portfolio responsibility of Ministers.

Cabinet has established seven committees to strengthen and support policymaking and planning processes. Each is chaired by a member of the Cabinet. Two are related to this assessment:

- *The Development Council*: This is an Inter-Ministerial body under the chairmanship of the Prime Minister. Its main focus is to monitor the timely implementation of the National Industrial Policy and to streamline and co-ordinate matters relating to the planning, development and management of public enterprises.

- *The Natural Resources Committee*: This committee is chaired by the Minister of Agriculture and Lands, and includes the CEO of NEPA as a member. The terms of reference for the committee focus on the National Land Policy. The main committee functions are to establish a coordinated mechanism for efficient and effective implementation of programmes, projects and initiatives relating to land use and the environment; to examine major land and environmental policies, plans or issues; and to ensure the implementation and monitoring of international commitments, particularly those which relate to land and the environment, and the provision of shelter.

***National Environment and Planning Agency (NEPA)*:** Under the Government of Jamaica Public Sector Modernization Programme (PSMP), NEPA was established and became operational on April 1, 2001. This agency was created through the merger of the Natural Resources Conservation Authority (NRCA), the Town Planning Department, and the Land Development and Utilisation Commission, the three government entities mandated with land development, planning and environmental management in Jamaica.

NEPA is headed by a CEO and consists of five divisions: integrated planning and environment; legal, standards and enforcement; corporate management; strategic planning, policies and projects; and, applications management. Due to legislation that existed prior to the merger of the three government entities, the CEO of NEPA reports to 3 Boards (the NRCA Board, the Town and Country Planning Authority Board, and the Land Development and Utilization Commission Board), and is advised by the NEPA Advisory Board.

NEPA's main functions are: to prepare development plans and development orders at national and parish levels; to process applications for development of land; to enforce environmental and planning laws and regulations; to manage and conserve the environment; to provide advice concerning environmental/planning policies; to participate in strengthening the capacity of parish councils, and to be the counterpart implementing agency for most major SD donor projects.

A key NEPA responsibility is the Permit and Licence System (P&L) operated by the Permit & License Secretariat. The P&L system provides a mechanism to consider the implications of proposed developments, to ensure that standards are met and negative environmental impacts are minimized. Persons undertaking new developments that fall within a prescribed category must apply for a permit. The application is processed by NEPA following established procedures, and a permit is granted or denied. If granted, NEPA is responsible for monitoring compliance with environmental standards and stipulated conditions of approval, although the extent to which this occurs is limited by available resources. If facilities do not comply, the NRCA Act of 1991 empowers the Authority to suspend and revoke permits and licences.

A key component in the P&L System is the Environmental Impact Assessment (EIA) process. This process is intended to provide all public and private interests with adequate information and time to determine the implications of proposed projects and alternatives to them. It is also intended to be a "full disclosure" process, which means that the EIA document must be comprehensive and unbiased and that the public must have sufficient time for review. However, as is discussed further in Chapter 6 of this report, in practice weaknesses in the EIA process mean that these objectives are not always achieved.

***The Ministry of Local Government and Environment (MLGE)*:** Following the last ministerial review in 2005, the Ministry of Local Government and Environment was created (bringing together functions previously in separate Ministries). The MLGE is mandated to set policy on local government reform and on environmental management and development planning. It has overall responsibility for local government authorities and for NEPA.

***Parish Councils (including KSA) and Parish Development Committees (PDCs)*:** The Parish Councils for parishes other than Kingston and St. Andrew (KSA) are established under the Parish Councils Act as bodies corporate. KSA is established under the KSAC Act, 1931. A Parish Council is composed of one councillor for each electoral division of the parish, elected every three years. The title of Mayor may be conferred by the Minister on the person bearing the title of chairman of a Parish Council. Each Parish Council is required to appoint a finance committee to regulate and control the finances of the Council. The main powers of the Parish Councils are to provide municipal services and enforce by-laws, rules and regulations. They are also responsible for processing applications for sub-divisions and the development of land, and participate in development planning with NEPA.

The Parish Development Committees (PDCs) are a unique partnership of government, private sector and civil society representatives. Created in the 1990s under the local government reform programme, they are becoming the advisory bodies to the Parish Councils on local development matters. Members are not elected but selected by the local authorities, the private sector and the Social Development Commission (SDC). The PDCs are seen as a mechanism with potential to broaden the democratic process and give civil society a stronger voice".[33]

***"Nexus" Ministries/Agencies*:** There are several other "nexus" ministries and agencies involved in the management, conservation and protection of Jamaica's environment. Several of the key organizations are presented in Table 4.4.

Table 4.4: Other Ministries and Agencies

Planning Institute of Jamaica (PIOJ)	PIOJ is a government body established under the Planning Institute of Jamaica Act, 1984 and it is headed by a Director-General appointed by the Minister of Finance. PIOJ's principal function is to initiate and co-ordinate planning for the economic, financial, social, cultural and physical development of Jamaica. It is also required to monitor the implementation of plans and to undertake research, to provide training in planning and to manage technical co-operation agreements and programmes. Since 2004 PIOJ has a Sustainable Development and Regional Planning Division.
Ministry of Agriculture and Land	This ministry has the responsibility to implement the agricultural policy in Jamaica. It recently acquired the land portfolio from the Ministry of Environment, including the *National Land Agency (NLA)*. This Ministry also includes the *Fisheries Division*, *RADA* and the *Forestry Department*. The functions of the latter are mandated by the Forest Act 1996 and include conserving and protecting the island's forests; managing the forested watersheds and forestlands; and directing and controlling the exploitation of forest resources through the introduction of appropriate systems for the renewal of those resources, the promotion and regulation of forest industries, forest research, public education and forestry training and education.
Ministry of Health	The Ministry of Health (MOH) is the government organization mandated to care for the nation's health. The Ministry, together with its Regional Health Authorities and related organizations, are responsible for health care delivery across the island. The Ministry's Environmental Health Unit provides advice on public health and environmental health issues, conducts environmental health assessments, manages environmental health projects, and investigates environmental health nuisances.
Ministry of Foreign Affairs and Foreign Trade (MFAFT)	This ministry is responsible for the negotiation and participation in regional and international agreements. Through the Council on Ocean and Coastal Zone Management, it has the oversight of the National Policy on Ocean and Coastal Zone Management.
The Statistical Institute of Jamaica (STATIN)	*The Statistical Institute of Jamaica (STATIN)* was established under the Statistics (Amendment) Act, 1984. The main functions of the Institute include: collecting, analysing, and publishing statistical information in collaboration with other public agencies. STATIN includes a Social and Environment Statistics Unit and publishes some environmental statistics on its web site.[34] It also produces triennial environment statistics with NEPA.

[33] Inter-American Development Bank. *Profile – Civil Society in Jamaica*. 2003

[34] www.statinja.com/env_stats.html

Bureau of Standards	The Bureau of Standards is a statutory body established by the Standards Act, 1968. Its main functions are formulating, promoting and implementing standards for goods, services and processes. The Bureau develops and enforces technical regulations for those commodities and practices which affect health and safety. The Standards and Certification department facilitates industry's participation to allow development of new standards and new markets locally and regionally. With the support of the IDB, the Bureau is helping about 50 companies to prepare for ISO 14001 Certification.

4.7 INTERNATIONAL AGREEMENTS TO WHICH JAMAICA IS A SIGNATORY

Jamaica is a Party to most of the major multilateral environmental agreements. A list of selected environmental treaties and protocols to which Jamaica is a signatory is presented in Table 4.5.

In 2004-2005 Jamaica conducted a National Capacity Self-Assessment (NCSA). This is an initiative funded by UNDP-GEF to identify the capacity development needs with respect to the implementation of the three Rio Conventions (Convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Framework Convention on Climate Change (UNFCCC)). The following points elaborate on the status of Jamaica's response to these three conventions:

- Under the UNCBD, Jamaica created a National Biodiversity Secretariat in 2003, a Biodiversity Committee, and completed its *National Biodiversity Strategy and Action Plan* (NBSAP) in 2003 (discussed previously in Table 4.2). However, implementation of this Convention and the related Cartagena Protocol on Bio-safety has been limited by the lack of human and financial resources. Few activities have been implemented to address the gaps and challenges identified in the national biodiversity strategy and action plan.

- Under the UNFCCC, Jamaica has submitted its First National Communication to the UNFCCC Secretariat. However since the ratification of the Convention by Jamaica, there is a lack of clear political commitment to allocate the necessary resources (budget and staff), and to establish a climate change secretariat and a functioning national climate change committee.

- Under the UNCCD, a working committee was created in 2000 but little progress has been made since Jamaica ratified this Treaty to meet its obligations as a Party. In 2005, the Ministry of Land and Environment (now Ministry of Local Government and Environment) approved a proposal to develop a National Action Programme (NAP) which is to be submitted to Cabinet for approval.

Despite some progress to implement international treaties and protocols to which Jamaica is a signatory, overall the resources allocated to these activities are not adequate if Jamaica is to meet its obligations. As the final NCSA report mentions, "*it is clear from the assessment that while there is broad based knowledge of the Conventions and an appreciation of their importance, Jamaica does not have the financial resources to adequately implement these Conventions*". The main barriers cited in the report are the lack of human resources with appropriate skills and knowledge; lack of financial resources; limited political will; and lack of coordination among the relevant agencies.

Table 4.5: Selected Environmental Treaties and Protocols to which Jamaica is Signatory[35]

Name of Treaty	Date of Accession For Jamaica	Entry into Force For Jamaica
Montreal amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1997	Sept. 24, 2003	
Beijing Amendment to the Montreal Protocol on Ozone Depleting Substances, Beijing,1999	Sept. 24, 2003	
Convention on Transboundary Movement of Hazardous Waste and their Disposal [Basel Convention] Basel, 1989	January 2003	April 2003
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Rotterdam, 1998.	August 20, 2002	
Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Montreal, 2000	June 4, 2001	
Stockholm Convention on Persistent Organic Pollutants (POP), Stockholm, 2001	May 23, 2001	
Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 1997.	June 28, 1999	
United Nations Convention to Combat Desertification Paris, 1994 (UNCCD)	Nov. 12, 1997	March 10, 1998
Copenhagen amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen, 1992	Nov. 7, 1997	Feb 4, 1998
Convention on Wetlands of International Importance especially as Waterfowl Habitats (Ramsar)	Oct. 7, 1997	Feb. 7, 1998
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	April 23, 1997	July 22, 1997
United Nations Framework Convention On Climate Change (UNFCCC), New York, 1992	Jan. 6, 1995	April 6, 1995
Convention on Biological Diversity (UNCBD), Rio de Janeiro, 1992	Jan. 6, 1995	April 6, 1995
Vienna Convention for the Protection of Ozone Layer, Vienna, 1990.	March 31, 1993	June 29, 1993
Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal 1987.	March 31, 1993	June 29, 1993
London amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990.	March 31, 1993	June 29, 1993
International Convention on the Prevention of Pollution from Ships, London, 1973 (MARPOL)	June 13, 1991	
Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, London, 1973	June 13, 1991	
Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter (as amended), London, Mexico City, Moscow, Washington, 1972	March 22, 1991	
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Cartagena de Indias, 1983 (Cartagena Convention)	May 1, 1987	
United Nations Convention on the Law of the Sea Montego Bay, 1982 (UNCLOS)	March 21, 1983	

[35] Government of Jamaica. *Jamaica National Assessment Report - A Ten-Year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States*. 2004

4.8 CIVIL SOCIETY

Civil Society in Jamaica refers to a wide range of self-organized, relatively autonomous associations such as non-government organizations (NGOs), labour unions, political parties, employer's associations, faith-based organizations, community based organizations (CBOs), academic institutions and private sector associations (see Section 4.9 on the private sector). Jamaica has an estimated 200 NGOs and 5,700 CBOs.[36]

These organizations have demonstrated their commitment to partnership building, enjoying a relatively good working relationship with the GoJ. However, they are also facing challenges: problems of resource accessibility and distribution, restrictive funding agency policies, unhelpful political and bureaucratic environments, weak community relations, and difficulty accessing appropriate information.

A particular area of concern seems to be direct funding of legitimate NGOs that are engaged in advocacy for the conservation of natural and cultural resources. Most NGOs are able to obtain funding to implement projects but they face difficulties finding sources of funding for advocacy work. In the last 5-10 years the advocacy groups in Jamaica demonstrated some significant achievements. One of the most significant was the recent "Pear Tree Bottom" court case where NEPA was ordered to reconsider the application for the project. However, despite the NGO/CBO contribution to protecting and conserving the environment, most of these groups are not in a good financial position to sustain their activities over the long term.

Under the policy for the National System of Protected Areas, one objective is to "confer responsibility for planning and management of protected areas on qualified local groups through delegation of authority". To date, only a few NGOs have been delegated management authority for specific protected areas. For example, the Caribbean Coastal Area Foundation manages the Portland Bight Protected Area (the largest protected area in Jamaica, including marine and coastal areas); the Jamaica Conservation and Development Trust manages the Blue and John Crow Mountain National Park; and the Montego Bay Marine Parks Trust manages the Montego Bay Marine Park. However, this process of delegating authority has been affected by problems including the length of time the process takes; lack of understanding of the roles and responsibilities of NGOs; and limited financial sustainability. The delegation process outlined in the policy needs to be strengthened if it is to succeed as intended.

4.9 THE PRIVATE SECTOR

The private sector in Jamaica is organized in business associations such as the Private Sector Organization of Jamaica (PSOJ), the Jamaica Manufacturers Association (JMA), the Jamaica Exporters Association (JEA), the Small Business Association of Jamaica (SBAJ), the Jamaica Chamber of Commerce, and sector-based associations such as the Motor Repairers Association of Jamaica (MRAJ) and the Jamaica Institute of Environmental Professional (JIEP). In the last few years, some attempts were made to consolidate some of these private sector organisations; however, the objective of consolidation was not reached and each organisation continues with its respective activities and budget.

The sector is faced with major barriers to business development. The cost to access capital (loans) is very high (currently up to about 17%) and the cost of security is also very high, both

[36] Inter-American Development Bank. *Profile – Civil Society in Jamaica.* 2003

limiting the competitiveness of Jamaica companies on world markets. Added to that, the various permitting and licensing systems are cumbersome and lengthy.

From an environmental point of view, several initiatives are worth noting:

- Currently, 27 tourism companies (most of them hotels) in Jamaica participate in the Green Globe programme: 20 are Green Globe Certified (have an integrated environmental management system), 4 are Green Globe Benchmarked (have passed an independent assessment against key indicators), and 3 are Green Globe Affiliates (committed to benchmarking and certification). There is also an on-going project to certify Portland as a Green Globe destination; which would be the first in the world.
- Four beaches and one marina in Jamaica are Blue Flag certified. The Blue Flag is an internationally recognized symbol of quality for beaches that are well managed and adhere to key environmental criteria for safety, cleanliness and environmental awareness.
- As of December 2006, 4 companies in Jamaica are ISO 14001 certified (2 in the bauxite sector, 1 in the banana sector and 1 in the paint sector) and 29 are ISO 9000 certified;
- The Jamaica Institute of Environmental Professional (JIEP) is an active association of environmental consultants. As part of its calendar of events, JIEP organizes a national conference every other year; in 2007 the main theme will be "*Business and Sound Environment Management in the Caribbean – What Makes it Work?*".
- In early 2000, 10 private sector organisations came together under the leadership of the PSOJ and with the support of the ENACT programme to create the Business Council for the Environment (BCE). The main role of the organization was to promote environmental management in the private sector through various voluntary mechanisms such as codes of practice, EMS and ISO 14001 standard. This Council is currently inactive.
- The coffee industry established a code of practice to improve coffee production practices by using more environmentally friendly methods to produce and process coffee beans. Following approval of the code and its implementation, the Coffee Industry Board undertook the process of ISO 9001 (quality) certification; it is now ISO 9001 certified.
- The sugar industry established a code of practice to improve their practices, promote more environmentally friendly technologies to process sugar cane, and improve the disposal of their releases to the environment.
- The Motor Repairers Association established a code of practice for their members including proper disposal of used oil, tires, batteries, etc.
- The Bureau of Standards has been conducting numerous training sessions for medium and large size companies on environmental management systems and the related international standards such as ISO 14001 and HACCP. As noted earlier, the Bureau is currently supporting 50 companies moving toward ISO 14001 certification.

Over the last 10 years the private sector has improved its environmental practices. However, the sector is firstly confronted with a difficult economic reality that is forcing many companies to operate in a survival mode, particularly the small and medium enterprises. It is difficult for these companies to focus on better environmental management practices.

Despite slow improvements in the area of environmental management, there are nonetheless a few drivers for change in this area, including NEPA's emerging standards and regulations for air quality, sewage discharges and trade effluents; international standards faced by Jamaican exporters and potentially their supply chains; and free trade and WTO negotiations.

CHAPTER 5. CROSS-SECTORAL ISSUES

5.1 OVERVIEW

Jamaica has largely emerged from the financial crisis and associated debt shock of the 1990s with demonstrated achievement on key economic issues such as debt reduction and fiscal management. Programs are in place for public service reforms and efforts are being made to increase the rate of private investment, which has to some degree been distorted by country investment risk and high rates of return from public debt. Inflation has been significantly reduced thereby increasing investor confidence and minimizing impacts on the poor, who tend to be disproportionately impacted by rising prices. Other positive changes include significant poverty reduction, rising real wages and income, and increased direct private and foreign investment.

Public debt management remains a critical component of the government's fiscal and macro-economic programme and will greatly influence the path of development for Jamaica over the medium-term. In order to manage the debt, Gross Domestic Product (GDP) growth will figure prominently with specific expansion targeted in the main productive sectors, namely bauxite mining/alumina processing and tourism. With the expansion of these sectors, there will be associated economic benefits such as increased employment, foreign exchange earnings and government revenue. While there are positive indicators of economic growth, there are real risks to development. The most significant of these would be the inability to achieve a broader set of environmental, social and economic objectives, especially over the longer-term. The benefits and costs of the current economic growth trajectory will also not be proportionally distributed, with the benefits tending to be national and macro-economic in nature and the costs localized at the ecosystem, local community and economy levels.

All of this is occurring in a governance framework that enables and encourages economic growth but, as shown in the previous chapter, does not consistently implement checks and balances to mitigate adverse and often localized social, economic and environmental impacts. This points to both a need to implement and enable current governance frameworks and also to look for opportunities to strengthen existing governance structures. This could include using current tax reform initiatives to identify opportunities for green budget reform. The current tax system impairs the achievement of important private sector policy goals in the *Medium-term Strategy* by distorting labour and capital decisions through the tax system. Under an expanded programme of tax reform, distortionary taxes and subsidies would be shifted away from labour and capital and onto activities that use resources such as physical infrastructure and natural capital (air, water and waste disposal). By shifting an increasing share of labour and capital taxes onto users of infrastructure and natural capital, the environmental governance framework would be strengthened. This would also provide an opportunity to raise revenues to finance infrastructure demands and thus help reduce public debt. This type of tax reform would complement current initiatives to increase user charges for resource use, such the air discharge fees.

This chapter further develops these concepts in the following sub-sections:

- 5.2 *Macro-Economic Performance* provides a brief overview of the current trajectory of economic development
- 5.3 *Key Economic Sectors: Bauxite and Alumina* provides an overview of how growth in the bauxite/alumina sector is linked to environment and development goals.
- 5.4 *Key Economic Sectors: Tourism* provides similar information for the tourism sector.

The topic of budget and fiscal reform and opportunities for tax shifting is considered further in Chapter 6.

5.2 MACRO-ECONOMIC PERFORMANCE

This section provides a brief overview of the significant macro-economic drivers that will affect medium-term government policy.

5.2.1 Gross Domestic Product Will Increase Above Recent Performance

After the financial shock of the 1990's, Jamaica is showing real progress on a large number of economic fronts. In the 1996 to 2000 period real GDP growth was negative, averaging -0.4% per annum. This slide has reversed in the post-2000 period with average GDP real growth in the order of 1.3% annually. This growth has been driven by increases in a number of key economic sectors as indicated in Table 5.1.[37]

Table 5.1: Importance to GDP by Sector

Sector	Average annual GDP Growth		Contribution to GDP		
	1996 to 2000	2001 to 2005	2000	2005	% Change
Transport, Storage and Communication	7.1%	4.0%	13%	14%	10%
Electricity and Water	4.9%	2.8%	4%	4%	8%
Mining and Quarrying	2.3%	3.2%	5%	6%	9%
Miscellaneous Services (mostly tourism)	2.2%	2.3%	9%	9%	3%
Distributive Trade (Wholesale and Retail)	0.3%	0.7%	23%	22%	-4%
Producers of Government Services	0.0%	0.4%	10%	10%	-5%
Financing & Insurance Services	-0.3%	0.4%	9%	8%	-6%
Real Estate & Business Services	-1.3%	1.4%	5%	5%	0%
Manufacturing	-2.8%	0.2%	6%	5%	-19%
Construction and Installation	-3.3%	3.6%	10%	11%	12%
Agriculture	-4.4%	-2.5%	14%	13%	-6%
Total Economy	**-0.04%**	**1.45%**			

Source: *Economic and Social Survey of Jamaica*, 2005 (ESSJ, 2005) and Bank of Jamaica Statistics, 2006

A number of key observations emerge from this table:

- Positive growth rates are concentrated in sectors important to overall GDP growth, notably construction, tourism, electricity and water, and mining.
- There are on-going weaknesses in important sectors, notably agriculture and manufacturing, which comprise in the order of 20% of GDP.

This counter balancing of moderate positive growth in about 35% of the economy with significant decline in 20% of the economy points to why overall GDP growth has remained moderate.

[37] Planning Institute of Jamaica. *Economic and Social Survey of Jamaica, 2005* and Bank of Jamaica Statistics www.bankofjamaica.net/economic_data.php?report_id=92

GDP Outlook is expected to be moderate over the medium-term. Projected GDP growth rates are in the order of 1% to 3% over the short- term with increasing rates over the medium-term in the order of 4 to 5%.[38] The increased medium-term GDP projections are largely due to increased tourism, bauxite and alumina production, and construction.

5.2.2 The Fiscal Situation is Tight but Improving

The fiscal situation of the GoJ continues to improve, with small overall positive balances projected for 2005/2006. This movement away from deficit to surplus and increased debt servicing has in part been due to increasing tax revenue (a 54% increase in revenue over 2002/03 - 2005/06 period) stemming from tax reforms initiated in the early 2000s and from fiscal restraint (see Table 5.2).

Table 5.2: Central Government Revenues and Expenditures

	Share in 2002/03	Share in 2005/06	% Change over period
Revenue and Grants			**61%**
Tax Revenue	93%	89%	54%
Non-Tax Revenue	4%	6%	167%
Bauxite Levy	2%	2%	81%
Capital Revenue	1%	2%	582%
Grants	1%	0%	-33%
Expenditures			**43%**
Programmes	18%	42%	231%
Wages and Salaries	34%	29%	21%
Interest	42%	19%	-35%
Capital Expenditure	5%	10%	149%

Source: *ESSJ*, 2005

Over the period tax revenue increased 61% while overall spending increased 43%. On the expenditure side, the government wage bill has begun to be addressed as evidenced by its decreasing share of the overall expenditures and its low change over the period, which indicates wage growth of 5.5 percent per year (well below inflation).

5.2.3 Government Debt is Being Managed

Servicing the on-going debt obligation, originating in large part from the financial crisis of the mid-1990s, will continue to be a major focus for the GoJ. Debt servicing increased over the 2002/03 to 2005/06 period and was large as an overall share of the budget allocation (67% in 2005/06). Indications are that the GoJ is disciplined with respect to its debt as evidenced by the on-going decline in the debt to GDP ratio which was in the order of 150% in 2003 but declined to 126% in 2005.

[38] Inter-American Development Bank. *IDB Country Strategy with Jamaica*. August 3, 2006.

5.3 KEY ECONOMIC SECTORS: BAUXITE AND ALUMINA

5.3.1 General Introduction

Sections 5.3 and 5.4 provide an overview of the key productive sectors and the link between economic growth, resource use and environmental impacts. This section (5.3) considers the bauxite and alumina sector; the next section (5.4) considers the tourism sector. These key economic sectors were selected for analysis since they are anticipated to be significant contributors to economic growth, are targeted by the GoJ as central to development policy, and have current and ongoing environmental impacts that are likely significant.

The basic question with respect to environmental resource development is to what extent environmental resources support development, including the aspects of fiscal, social, economic and environmental development. Some basic conclusions emerge from the discussion in Sections 5.3 and 5.4 that explain the trajectory of economic growth and development in Jamaica:

- The tight government fiscal situation and high public debt servicing will continue to distort resource use decisions leading to development outcomes that are likely sub-optimal and focused narrowly on short-term economic objectives such as foreign exchange earnings, debt servicing and direct foreign investment.

- Economic development is taking place with insufficient governance controls and incentives to mitigate adverse development impacts and outcomes. This leads to an increasingly high risk that stated GoJ economic, social and environmental objectives may not be achieved or may be impaired.

5.3.2 Overview of the Bauxite and Alumina Sector

Given sustained international demand, the government's need for foreign exchange earnings, direct foreign investment and government revenue will result in significant growth in the bauxite and alumina sector over the medium-term. While a wide range of economic benefits will flow from a continued expansion of the sector, there are development challenges. Notably, the land traditionally used for the open pit mines is classified as fields and to a lesser extent mixed forest and thus its use for mining will constrain future land uses that currently support rural livelihoods. Removing this land from agriculture and other uses for very long periods of time may have implications for poverty reduction, especially among the rural poor whose livelihoods are more subsistence based and therefore most impacted when new mines constrain future land uses. Socially, the dislocation of some people from areas slated for mine development can be expected to have negative social implications.

Important impacts on biodiversity can also be expected, thereby reducing Jamaica's natural capital. Water use and the generation of process waste (red mud) will continue to increase proportionately to production. This will have a number of effects. First, the very high water consumption could lead to water use conflicts, water supply depletion, and/or supply contamination, thereby constraining both social and economic development objectives. Second, while red mud is generally handled so as to reduce environmental impacts, the size of the waste problem will grow with increased development in this sector, thereby creating a higher risk of

future downstream environmental impacts.[39] Finally, uncontrolled refinery emissions are the dominant source of criteria air emissions in Jamaica; any increase in emissions can be expected to lead to increasing adverse health and economic damages.

Each of these topics is explored in more detail below.

5.3.3 Growth and Economic Contribution

The bauxite and alumina industry is a significant contributor to the economy and the government's fiscal balance. In the post-2000 period the sector accounted for 9% of GDP annually, 3.5% of government revenue, and importantly 67% of export earnings. In 2005, it directly employed 4,000 people, which is less than 0.5% of all employment in Jamaica. The bauxite and alumina sector dominates the mining and quarrying sector representing 96% to 98% of the total value.

The labour intensity of the sector is decreasing. The historical labour intensity shows a steady decrease in employment per unit of production. Table 5.3 indicates that the labour intensity relative to both GDP and production dropped over the 2000 to 2005 period. This trend is consistent over a longer historical period.

Table 5.3: Labour Intensity

	Employment/$J Million GDP	Employment/000 tonnes extracted
2000	0.35	0.41
2001	0.35	0.44
2002	0.36	0.30
2003	0.25	0.28
2004	0.19	0.29
2005	0.17	0.28

Source: *ESSJ*, 2005

The bauxite and alumina sector is expected to expand at a higher rate than the overall economy. Increased production can be expected thereby leading to increased foreign exchange earnings, government revenue, GDP growth and employment. Increased capital investment in refineries and international demand will add to the positive economic impacts of the bauxite and alumina industry and result in increased mining extraction. Current production levels show steady increases in the order of 5% per year since 2000. Interestingly, GDP growth in the sector has been higher over the same period and in the order of 9%, reflecting increased value added from alumina exports.

Bauxite reserves enable long-term growth and expansion. The upstream bauxite mining industry is dependent on the 1.5 billion tonnes of reserves that are economically viable. Another 0.5 billion tonnes are "inferred", meaning that they have yet to be classified as economic.[40] Another 0.5 billion tonnes are classified uneconomic. At current production rates, there is in the order of 106 additional years of reserve stock.

5.3.4 Implications of Growth: Resource Demands and Waste Generation

Land Use

Bauxite extraction since 1988 has significantly increased its land use compared with all other land uses. In 1998, bauxite land use represented in the order of 0.5% of the total land and water surface area in Jamaica. Between 1989 and 1998 bauxite extraction increased its total land use from 2,783 hectares (ha) to 7,882 ha, representing an increase of 5,099 ha or 183% over

[39] There is also a significant legacy issue associated with red mud ponds at older mines that have been abandoned or were constructed without due regard for minimizing the environmental impact.

[40] *ESSJ*, 2005

the period.[41] This high growth in land use compares sharply with other land use changes that ranged between a low decline of -7% (swamp) to an increase of 6.5% (bamboo cover). Other comparisons of the rate of change over the 1989 to 1998 period include land used for buildings which increased 0.7%; fields, which increased 0.5%; and plantations which increased 1%.

Bauxite land use primarily displaced land classified as "field". Over the 1988 to 1998 period, the displaced lands were classified as "field" (47%), as "field and forest" (46%) and "forest and fields" (7%).[42] Historical bauxite land use has therefore been concentrated primarily in land classified as fields, which implies a disproportionate impact of bauxite mining on "fields" relative to all other land uses. There has been a lesser impact on land classified as forest.

A significant share of land used for past mining extraction has not been reclaimed. Historically, 24% of mining lands have not been reclaimed and continue to impact local environments and constrain local land uses.[43]

Red Mud Waste

The bauxite sector is increasing its red mud waste roughly at the rate of alumina production, which is continuing to increase. Approximately one tonne of red mud waste or residue will be produced from each tonne of alumina.[44] Based on this simple relationship, the bauxite mining industry is increasing its red mud waste roughly at an annual rate in the order of 4 million tonnes. In most cases this is adequately handled in contained areas thereby reducing its potential environmental impact. However, the treatment areas occupy increasing land area, contributing to the land use issues discussed above.

Water Use and Water Quality

Water consumption and use is high in the bauxite and alumina sector. Water added in the alumina production process accounts for about 70% of the content of red mud. This implies that for every tonne of bauxite extracted, there is 0.2 m^3 of water used in the alumina production process. The industry has moved to a system of recycling water thereby leading to lower relative water consumption. That said, water consumption will continue to be very high.

Ground water and surface water contamination is originating from caustic soda, a chemical used in production and found in red mud (process waste). One notable example is Moneague Lake, at one time proposed for development as a recreational park, which is being polluted by caustic soda from the red mud lake on Mount Diablo.

Other Impacts

Sector energy use is a high share of total Jamaican energy consumption and will continue to increase at a high rate. Alumina production and mining are both energy intensive, with the sector accounting for 37% of all petroleum imports.[45]

---

[41] Evelyn, O.B. and R. Camirand. *Forest cover and deforestation in Jamaica: an analysis of forest cover estimates over time.* Intl Forestry Review 5(4), 2003. www.forestry.gov.jm/PDF_files/JA%20Forest%20Cover%20Change.pdf

[42] Field and forest: > 50% field and >25% forest. Forest and field: >50% forest and >25% field.

[43] Government of Jamaica. *National Strategy and Action Plan on Biological Diversity in Jamaica*. GoJ White Paper, 2003.

[44] OAS. *Recycling of Industrial Effluent in Jamaica.* http://www.oas.org/dsd/publications/unit/oea59e/ch36.htm

[45] *ESSJ*, 2005.

The bauxite sector is a dominant source of carbon and criteria air contaminant emissions. Air emissions data for 1994 (the latest official inventory), indicate that bauxite mining accounted for 46% of all carbon, 32% of all NO_X and 60% of all SO_2 emitted nationally. Establishing a ratio of emissions to bauxite production for 1994 and applying it to historical production suggests that bauxite emissions have been increasing at an annual rate in the order of 4%.

For PM, emissions from smelters have been estimated to be in the order of 20 to 80 kg per tonne of product, which implies that particulate emissions from kilns in 2005 were in the order of 200,000 tonnes.[46] Emissions from mining would be incremental to this, and significant.

Emissions will be considerably lower once the *Air Quality Regulations, 2006* come into force and firms are required to increase emission controls.[47] The potential development of liquefied natural gas (LNG) infrastructure and its use in the processing sector would significantly lower emissions of PM and SO_2 but increase NO_X emissions. The use of coal and its infrastructure to support increased production in the sector is environmentally less attractive unless effective emission control technologies are used.

5.3.5 Development Implications of Growth

The overall environmental implications of continued growth in the bauxite sector are presented in a matrix in Table 5.4. This exhibit provides a simple qualitative overview of the implications for bauxite production on resource use, waste generated and air emissions. These trajectories of production, resource use and waste are then translated into a range of fiscal, social, economic, and environmental development outcomes, presented in Table 5.5. These two tables together provide an overall picture of the implications of economic growth of the bauxite sector.

Table 5.4: Bauxite & Alumina:
Linking Economic Development, Resource Use and Waste
(indicative estimates – see text for explanation)

		Economic		Resources Consumed		Energy (10^6 barrels)	Red Mud Waste (000 t)	Releases to the Air			
		GDP $J million	Labour	Bauxite (000 t)	Water (000 m^3)			CO2 (000 t)	NOx (000 t)	SO2 (000 t)	Particulate Matter (000 t)
Trends based on actual production	2000	13,287	4,600	11,127	2,520	8,763	3,600	3,520	9.21	56.43	180.00
	2001	14,820	5,400	12,369	2,479	8,595	3,542	3,607	9.44	57.83	177.10
	2002	15,690	4,000	13,119	2,541	9,167	3,630	4,010	10.49	64.28	181.50
	2003	20,154	3,787	13,444	2,690	9,545	3,843	4,253	11.13	68.18	192.15
	2004	22,717	3,822	13,296	2,815	9,454	4,022	4,358	11.40	69.87	201.10
	2005	23,838	3,939	14,118	2,860	9,812	4,085	4,311	11.28	69.10	204.25
Projection	2006	24,791	3,689	14,718	3,022	10,541	4,317	4,577	11.98	73.37	215.84
	2007	25,783	3,251	15,234	3,128	10,911	4,468	4,772	12.49	76.49	223.41
	2008	26,814	2,865	15,750	3,234	11,280	4,620	4,939	12.92	79.18	230.98
	2009	27,887	2,524	16,266	3,340	11,650	4,771	5,106	13.36	81.86	238.54
	2010	29,002	2,225	16,782	3,446	12,020	4,922	5,273	13.80	84.54	246.11

[46] World Bank Group. *Pollution Prevention & Abatement Handbook.* July 1998. www.elaw.org/assets/pdf/47%5Falum.pdf

[47] Claude Davis & Associates and Kaizen Training & Management Consultants Ltd. *Technical Support Document For The Regulatory Impact Analysis For Air Quality Regulations Developed By The National Environment And Planning Agency.* Prepared for the National Environment and Planning Agency. November, 2002.

Table 5.5: Bauxite Industry Growth and the Implications for Development

	Development Implications			
	Fiscal	**Social**	**Economic**	**Environmental**
Growth and Economic Contribution				
GDP • Contribution ~10% to total economy • Sector growing 4% to 5% annually	*Moderate benefits*. Indirect revenues from allied and linked sectors	*Important benefits*. Positive correlation between poverty alleviation and GDP growth	*Important benefits.* Multiplier effects to linked sectors likely low due to capital intensive sector (high import share)	*Important benefits.* Pollution control costs a small fraction of overall growth Income can lead to increased capacity to control emissions
Government revenue • Contributes 3.5% annually and growing	*Important benefits*. High share of revenue	*Important benefits*. Finances investments in priority areas		
Foreign exchange. • 67% of exports and growing	*Important benefits*. Foreign exchange to service debts and finance imports			
Employment. • 4,000 employed and shrinking (0.5% of all employment)		*Moderate benefits*. High wages but low employment		
Resource Demands				
Land Use • Increasing land use as production increases • 76% of land restored, stock of land not restored increasing		*Important costs*. Constrained land uses lead to livelihood impacts Displacement of people from new mining lands	*Important costs*. Constrained land use primarily in fields displaces agriculture and other uses over the long-term.	*Important costs*. Biodiversity and habitat loss
Water • High water use and growing wastewater volumes		*Important costs*. Ground and surface water contamination. Depletion of water reserves	*Important costs.* Constrained downstream uses such as freshwater aquaculture	*Important costs*. Biodiversity and habitat loss from wastewater flows
Energy • 37% of all energy use of growing	*Moderate costs*. Possible subsidization and infrastructure provisions and impact on foreign exchange reserves			
Waste				
Red Mud • 4 million tonnes annually added and increasing	*Moderate costs.* Legacy issues for clean up could be a long-term issues for abandoned mines	*Important costs*. Seepage could result in downstream health impacts related to water contamination	*Important costs.* Constrained downstream uses such as freshwater aquaculture	*Important costs*. Water contamination and impacts on flora and fauna. Loss of habitat from areas used for dry stacking.
CO_2 • 46% of all carbon emissions and increasing				*Important costs*. Climate change and variability
Air Emissions (NO_X, PM and SO_2) • Nationally, 32% of all NO_X, 60% of all $S0_2$ emitted 55% of PM emissions		*Important costs*. Significant health morbidity and mortality outcomes and economic damages	*Moderate costs*. Crop damages associated with ozone and acid deposition. Reduced crop yields.	*Moderate costs*. Vegetation and materials impacts from acid deposition and health impacts from PM

5.4 KEY ECONOMIC SECTORS: TOURISM

5.4.1 Overview of the Tourism Sector

The tourism sector is experiencing unprecedented growth due to increased foreign investment and demand for the "Jamaican product". Government is accommodating the growth through various polices and fiscal incentive arrangements. There is no doubt that the growth is fuelling employment, investment and foreign exchange earnings, but the net economic benefits are unclear. One example is the rising share of import substitution in goods consumed by the sector (and large resorts in particular) leading to lower spin-off benefits in the linked food and manufacturing sectors. Another example is the low levels of taxation enjoyed by the sector through long-term tax concessions and the rising cost of infrastructure and social services linked directly to resort development.

While economic growth is likely providing macro-economic benefits, a number of troubling regional issues are emerging that highlight the inability of local economies, societies and ecosystems to readily absorb the implications of unconstrained tourism growth. Notable examples include the link between tourism visits and urbanization; increased demands for social and infrastructure services (both direct and indirect from urbanization) and the resulting demand on government budgets; and limited local government decision-making in development planning. Other issues include the location of increasingly large resorts in highly valued and sensitive ecological areas; the generation of large amounts of wastes and resource depletion (notably water) associated with large resorts; and a deteriorating natural environment leading to a lower quality tourism product. This results in a situation where negative environmental and social impacts are increasing and impairing longer term development prospects while the macro-economic benefits of the sector are not optimized. Tax incentive structures also skew the development while increasing the fiscal constraints on the government.

Each of these topics is explored in more detail below.

5.4.2 Growth and Economic Contribution

Tourism is a significant contributor to the economy and government tax revenue and is the premiere source of foreign exchange earnings. GDP growth has been steadily increasing in the tourism sector fuelled primarily by increased visitors and investment. Since 2002 tourism's contribution to GDP has been growing in the order of 4.5% annually with higher levels of growth projected for the 2006 to 2010 period. Tourism's direct contribution to GDP is in the order of 6%. The tourism tax (Tourism Enhancement Fund) contributed significantly to GoJ revenues and was about 1.5% of all tax revenue in 2005 alone. Other direct and indirect taxes were likely significant given the size of the sector. Foreign exchange earnings averaged US$1.45 billion annually between 2001 and 2005.[48] This is roughly equivalent to about 90% the all export earnings from all goods exports including bauxite and alumina in 2005. Foreign exchange earnings from tourism have been increasing at an average annual rate of 9%.

The sector is a major direct employer. Direct employment in the tourism industry has been growing and accounted for 3.2 % of all Jamaican employment or 30,500 employees in 2005.

[48] *ESSJ* 2005. The net travel balance of payments surplus is in the order of US$1.2 billion.

Indirect employment in agriculture, transportation and distribution account for another 62,400 indirect jobs, which when combined with direct jobs represented approximately 9.6 % of the employed labour force in 2005.[49] In addition, informal employment associated with this sector would increase this number.

The sector has significant spin-off benefits for linked sectors. The output multiplier for the Jamaican tourist industry is small, where for every $1.00 spent in this sector, $1.00 in output would be generated from the other sectors of the economy. Sector employment, agriculture, transport, storage & communication, construction and distribution are the primary beneficiaries from a dollar spent within the tourism industry.[50]

Government policy has targeted this sector for continued expansion. The GoJ, as part of its industrial policy, has embarked on a number of initiatives to facilitate investments in new hotels, renovation and refurbishing of existing hotels, as well as product diversification. Examples of support include incentives such as 10- to 15-year tax holidays on income, customs duties and the GCT (sales tax). The Tourism Master Plan is the focal point of GoJ plans for the sector. The Plan calls for an investment of US$2 billion over 10 years. Seventy-three percent of this will take the form of private sector investment in commercial ventures such as hotels and attractions. Public sector-led projects will need in the order of US$542 million, with nearly US$220 million to come from the Government of Jamaica. Currently, options to finance the Master Plan are being explored by both Government and the private sector.

Jamaica's tourism industry is projected to grow at a high rate in the medium-term. Projected annual growth in the order of 7.9 % over the next 5 years is anticipated as compared with an average of 2.4 % in the previous 5 years. This growth is expected to facilitate the construction of 12,000 new hotel rooms that would increase the current room stock by approximately 50%.[51] These recent projections are nearly double those anticipated in the Tourism Master Plan.

Increased growth will produce employment, especially in the low-skilled category. Forecasts indicate that approximately 16,800 jobs will be created within the tourism industry over the next four years or roughly 1.39 new jobs per new room. This is a significant source of new employment and supports the GoJ's economic policy goal of "labour-intensive" growth.

Increasingly there is a low and declining relative economic impact from the sector. Recent analysis points to the continued low and declining relative economic impact of the industry on the overall economy. The low multiplier is not surprising given that much of the recent growth has been in the large "all-inclusive" resort category, which generally has a lower impact on the economy per dollar of revenue than other accommodation sub-sectors. Some studies suggest that in the order of 50% of the value of export earnings are lost due to leakage, since increasingly imported goods are consumed to support the sector.[52] The fiscal incentive structure for the

[49] McCatty, Machel & Prudence Serju. *Tourism, Economic Growth & Employment*. 2006. Bank of Jamaica Working Paper. http://www.ccmsuwi.org/Files/amsc/pserju_pap06.pdf

[50] *Ibid.*

[51] *Ibid.*

[52] Organization of American States. *Economic Analysis of Tourism In Jamaica*. September, 1994.

industry enables duty free imports for construction and facility furnishings and has thus led to increasingly high import content in tourism final demand.[53]

5.4.3 Implications of Growth: Resource Demands and Waste Generation

Water use is rising rapidly and is concentrated in areas with existing capacity concerns. Water demand in new developments is averaging in the order of 0.69 mega-litres per year per room. This is approximately 5 to 8 times greater than the average per capita domestic water consumption for Jamaica over the 2000 to 2005 period.[54] It is also equivalent to about 10% of all water produced by the National Water Commission (NWC) in 2005. Simple projections based on tourist visits imply that water use in the tourism sector will grow by 45% over 2005 to 2010 period.

Rising water use and infrastructure needs will require significant budget outlays. National Water Commission estimates for 2004 place the value of water infrastructure projects required in the northwest tourism region alone at US$250 million.[55] While most resorts build their own water supply and treatment facilities, the associated urbanization that accompanies large resort developments (enclaves) will result in an increasing demand on government resources to supply water, monitor wastewater treatment facilities, and handle solid and special wastes (grease).

Water use will lead to increased pollutant loading in surface waters. Two sources of pollutant loading can be envisioned, with the first being during the construction phase and the second being wastewater loading during operation. Assuming new developments install secondary treatment, the new development will result in total BOD loading to surface waters to be in the order of 400 tonnes in 2010, up from 285 tonnes in 2005. Other loading, including fecal coliforms, will increase in the absence of requirements for tertiary treatment (i.e., additional controls such as disinfection). Incremental additions from enclave developments adjacent to resorts would significantly increase loadings.

High growth will lead to very high levels of solid waste. The increasing number of tourists, with extremely high consumption habits, places a disproportionate strain on the local waste management infrastructure. Studies indicate that the average tourist produces three times as much solid waste as the average resident. In 1996 the average Jamaican generated 0.7 kg of solid waste per day.[56] Based on tourism figures for visitor days in 2005[57], an estimated 31,000 tonnes of solid waste was likely generated from the tourism sector (excluding cruise ship visits). This represents about 4.5% of all domestic solid waste generated for the entire Jamaican population of 2.6 million. Given current tourism projections, the total amount of waste will grow in the order of 41% through 2010 and will represent an increasing share (6%) of all domestic solid waste produced in Jamaica.

---

[53] McCatty, Machel & Prudence Serju 2006. *op.cit.*

[54] Estimated from Massa, Alison. *Framework Programme of Action: Tourism*. 2006 for PIOJ. Table 2.18 based on JAMPRO estimates of water demand. Assumes occupancy rate of 60% in the calendar year and an average of three guests per room. *ESSJ* 2005 provides the per capita estimate of water consumption.

[55] A *Water Supply Master Plan, 2004* for the Northwest tourism region was developed to match demands with increased supply.

[56] Statistical Institute of Jamaica and NEPA. *Jamaica's Environment 2001*. 2001.

[57] *ESSJ*, 2005

Energy consumption will continue to increase at a high rate. Analysis completed for the development of the National Energy Policy indicates that the expansion outlined in the Tourism Master Plan will require additions of 60 MW of new electrical generation for 10,000 new rooms.[58] Using this estimate and prorating it to recent growth projections for tourism implies that in the order of 230 MW of electrical capacity will be required by the sector in 2010, which is about 30% of Jamaica's total projected peak demand in 2010. Cooking and transportation fuel use would be incremental and can be expected to increase as well. Increased energy demand is associated with various impacts, including air emissions from electricity generation.

Increased migration to the Northwest Tourism Region will lead to increased population, urbanization and the associated demands for social, water and waste services. Population growth estimates for the 1990s indicate that the Northwest Tourism Region had population growth rates that were double that of previous decades. Tourism related development is projected to increase the population in the order of 30% over the 2001 to 2011 period, and lead to increased urbanization and higher demands for social services and housing.[59]

5.4.4 Development Implications of Growth

The overall environmental implications of the continued growth in the tourism sector are presented in Table 5.6. This exhibit provides a simple qualitative overview of the implications for growth in the tourism sector on resource use, waste generation and air emissions. These trajectories are then translated into a range of fiscal, social, economic, and environmental development outcomes presented in Table 5.7 These two exhibits together provide an overall picture of the implications of economic growth of the tourism sector.

Table 5.6: Tourism: Linking Economic Development, Resource Use and Waste
(indicative estimates – see text for explanation)

		Economic			Resources		Waste	
		Visits*	**Rooms**	**Employment**	**Electrical Demand (MW)**	**Water Use 000 m^3**	**Sewage Tonnes BOD**	**Solid Waste Tonnes**
Trends based on actual	2002	1,266,366	22,489	31,318	135	16,875	244	26,590
	2003	1,350,285	24,635	34,306	148	18,485	268	28,360
	2004	1,414,786	24,947	34,741	150	18,719	271	29,710
	2005	1,478,663	26,194	36,478	157	19,655	284	31,050
Projections	2006	1,595,477	28,264	39,360	170	21,208	307	33,510
	2007	1,721,520	30,497	42,469	183	22,883	331	36,150
	2008	1,857,520	32,906	45,824	197	24,691	357	39,010
	2009	2,004,264	35,505	49,444	213	26,642	386	42,090
	2010	2,162,601	38,310	53,350	230	28,746	416	45,410

*Average 10 day duration per visit. Visits excludes cruise ship passengers.

[58] Cabinet Office. *The Jamaica Energy Policy Analysis*. December 2005. p.30.

[59] Massa 2006 *op.cit.*

Table 5.7: Tourism Growth and the Implications for Development

	Development Implications			
	Fiscal	**Social**	**Economic**	**Environmental**
Growth and Economic Contribution				
GDP • Contribution ~6% to total economy • Sector growing 8% to 10% annually	*Moderate benefits*. Indirect revenues from allied and linked sectors	*Important benefits*. Positive correlation between poverty alleviation and GDP growth	*Important benefits.* Multiplier effects to linked sectors is high.	*Moderate benefits.* Pollution control systems used in some local areas
Government revenue • Contributes >1.5% annually and growing	*Important benefits but high costs*. - High share of revenue, tourism tax alone is 1.5% of all revenue and growing - US$542 million to fund expansion	*Important benefits*. Finances investments in priority areas		
Foreign exchange. • US$1.45 billion annually, equivalent to 90% of all good exports	*Important benefits*. Foreign exchange to service debt and finance imports. Net effect lower due to high import share			
Employment • 30,500 direct • 62,400 indirect • 10% of all employment		*Important benefits*. - Major employer, but low wages - 16,000 new jobs created by 2010	*Important benefits*. Spin-off spending from increased household income	
Resource Demands				
Land Use • 46% growth in rooms over the 2005 to 2010 period • Linked growth to enclaves/urbanization	*Important Costs.* - Infrastructure investments is social services - Tax expenditures to finance development and provide incentives	*Important costs*. Social impacts associated with urbanization	*Important costs*. Impact on ecosystem functions impairs local uses and other economic activities such as nature tourism and fisheries	*Important costs*. - Linked waste releases associated with enclave development around resorts and tourism agglomerations - Biodiversity impacts
Water • High water use growing in the order of 45% by 2010 • Wastewater loading increases significantly	*Important Costs.* High infrastructure costs for water and wastewater services both for the industry and for enclaves - US$250 million for current projects alone		*Important costs.* - Water use conflicts due to high water use - Impact on ecosystem functions impairs local uses and other economic activities such as nature tourism and fisheries	*Important costs*. - Biodiversity and habitat loss from wastewater flows and discharges - Ground and surface water contamination. - Depletion of water reserves/salt water intrusion
Energy • 30% of peak electricity demand in 2010	*Important costs*. Possible subsidization and infrastructure provisions and impact on foreign exchange reserves	*Important costs*. Health damages associated with air emissions	*Important costs*. Health damages have significant economic value	*Important costs*. Air and water pollution impacts on flora and fauna and on water supplies
Waste				
Solid Waste • Over 30,000 tonnes in 2005 or 4.5% of all domestic waste, growing to 6% in 2010	*Important costs.* Increasing investments in solid waste management	*Moderate costs*. Health impacts associated with water contamination and other waste related illnesses	*Moderate costs.* Feedback loop on tourism product, with increased waste decreasing tourism experience	*Important costs*. Impacts ecosystem functions and services. Impacts water supply through leaching.

CHAPTER 6. ENVIRONMENTAL CHALLENGES & OPPORTUNITIES

6.1 GENERAL FINDINGS

Chapter 2 provided a brief review of Jamaica's development priorities and plans as presented in the *Medium Term Socio-Economic Policy Framework,* and concluded that these priorities and plans require an environmental management apparatus that is capable and effective. Without strong environmental capacity, Jamaica's goal of sustainable development cannot be fully realized, and potential environmental issues/problems associated with the development process are likely to impose unnecessary costs on Jamaican society.

Chapter 3 provided an overview of environmental issues in Jamaica, focussing on a number of key environmental stressors: releases to air, releases to water, solid waste, land use, resource use, energy development and use, and natural hazards. The chapter demonstrated that Jamaica is confronted with a range of important environmental challenges arising from past activities and practices, and showed that these challenges are likely to become more significant in the future due to economic growth and other factors. Some of these challenges are relatively well understood or at least widely recognized, including important areas of past engagement by the IDB (such as solid waste, wastewater, and local development planning). Other issues are emerging and warrant increased attention, including the impacts of various potential energy developments (oil and gas, LNG, ethanol), development projects in increasingly sensitive areas (e.g. bauxite mining in the Cockpit Country), and the expected impacts of climate change.

Chapter 4 reviewed the environmental governance framework in Jamaica, examining the policy and legislative frameworks, the institutional structures, and the roles of civil society (including the private sector). The chapter demonstrated that Jamaica has an established environmental governance framework with significant elements in place, reflective of past and present concern for environment and sustainable development in both government and civil society. However, the chapter also showed that environmental governance in Jamaica suffers from important weaknesses arising from structural, capacity, and resource limitations. As a result, Jamaica is unable to consistently implement checks and balances to mitigate adverse and often localized social, economic and environmental impacts of development.

Chapter 5 reviewed cross-sectoral socio-economic issues, examining both broad macro-economic issues and more detailed socio-economic and environmental impacts associated with the bauxite and tourism sectors. The chapter concluded that the tight government fiscal situation and high public debt servicing will continue to drive economic policy, with decisions focused on short-term economic objectives such as foreign exchange earnings, debt servicing and direct foreign investment. This short term orientation tends to distort resource use decisions, leading to development outcomes that are likely sub-optimal. In the absence of sufficient governance controls and incentives to mitigate adverse outcomes, there is an increasing risk that GoJ economic, social and environmental objectives may not be achieved or may be impaired.

Taken together, the previous chapters demonstrate that protection of the environment is central to Jamaica's development. More specifically, the previous chapters support the following important conclusions:

Conclusion #1. Effective and broadly focussed environmental management is a fundamental requirement if Jamaica is to achieve its long term development objectives.

- Jamaica's development priorities and plans are fully compatible with strengthened environmental management.
- Jamaica's development priorities and plans in fact require an environmental management apparatus that is efficient, capable, and effective so that environmentally sustainable development is ensured and potential environmental impacts/problems are prevented and/or managed.

Conclusion #2. Because effective governance is essential to environmental management in Jamaica, the highest priority should be attached to initiatives that address critical institutional and governance issues.

- Strengthening the institutional and governance framework for environmental management is a fundamental requirement to resolve environmental issues, ensure that Jamaica's development goals are achieved, and ensure the success of IDB interventions.

Conclusion #3: Notwithstanding the overarching importance of governance, many specific environmental issues are also of critical importance and warrant action in the near term.

- Environmental stressors affect a wide range of human and natural resources. For existing issues, action now can mitigate impacts that may already be significant. For emerging issues, action now can help avoid or reduce problems before they become significant.

The balance of this chapter expands upon these conclusions:

- **Section 6.2** elaborates upon Conclusion #2, highlighting a number of the key governance challenges.
- **Section 6.3** elaborates upon Conclusion #3, identifying possible areas of focus among the key environmental issues.

6.2 KEY GOVERNANCE CHALLENGES

6.2.1 Introduction

As stated above, strengthening the institutional and governance framework for environmental management is a fundamental requirement to resolve environmental issues, ensure that Jamaica's development goals are achieved, and ensure the success of IDB interventions.

Notwithstanding the fact that Jamaica has an established framework with significant elements in place, environmental governance in Jamaica suffers from weaknesses arising from structural, capacity, and resource limitations. The most important of these issues are briefly noted in Table 6.1, organized into selected categories drawn from the governance overview in Chapter 4.

Table 6.1: Summary of Institutional/Governance Issues

Policy Framework
- Lack of current national development plan
- Lack of approved and current sectoral policy frameworks in many areas (drafts remain drafts)
- Lack of discipline in applying certain existing policies

Institutional Framework: NEPA
- Fragmented legislative base
- Difficult institutional structure (multiple boards, executive agency status)
- Capacity constraints:
  - Policy capacity
  - Planning capacity
  - Technical capacity
  - Monitoring and enforcement capacity
  - Board capacity and role
- Specific issues: P&L and EIA processes; absence of or outdated parish Development Orders; environmental data/database; capacity in areas such as cumulative impacts and non-regulatory approaches

Institutional Framework: Other Ministries and Agencies
- Generally limited capacity to carry out environmental mandates
- Few adopted and/or implemented sectoral environmental policies/guidelines
- Few established environmental focal points
- Uneven application of cross-sectoral environmental policies (e.g. SEA, greening of government)
- Limited monitoring of to ensure implementation of environmental policies
- Generally limited capacity to monitor and analyze environmental data (including benefit-cost analysis)
- Possibly limited capacity to deal with emerging issues (e.g. petroleum exploration, development)

Civil Society
- Need for strong civil society organizations to ensure sound planning & implementation of policies & plans
- Need for participatory mechanisms for environmental and social policy making
- For delegated authority NGOs, need for sustainable financing and management arrangements

Private Sector
- Limited access to low cost capital for environmental improvements
- Lack of capacity to respond to international standards ISO14000, HACCP, etc.
- Lack of capacity to engage in pollution prevention (e.g. packaging)
- Lack of capacity to provide environmentally friendly inputs to tourism market, agriculture, etc.
- Weaknesses in government/private sector relationships:
  - Challenges in collaborative processes and links with key agencies (NEPA, Bureau of Standards)
  - Need for clear, predictable, efficient and timely processes based on a clear policy framework.

In addition to the issues presented in Table 6.1, two other generic issues directly and indirectly affect environmental governance in Jamaica. First, government agencies face significant challenges in sustaining professional capacity in the face of high levels of management and senior staff turnover. Second, knowledge and capacity gaps exist in all sectors, including the general public, public and private sector decision makers, and professionals at all levels.

6.2.2 Priority Governance Issues

From this long list of governance issues, the consulting team believes that two organizational clusters should be assigned highest priority for possible engagement with the Bank: (1) **NEPA and key collaborating organizations at the local level**, and (2) **the private sector**.

NEPA and key collaborating organizations at the local level

The selection of **NEPA** as a priority was based on consideration of the following institutional criteria:

- Environmental "leverage"
- Institutional potential
- Institutional independence
- Institutional commitment to good governance principles (accountability, fairness and equity, evidence-based decision-making, etc.)

Environmental "leverage" refers to the ability of an organization to make a significant difference in a wide range of environmental areas. NEPA is at the "epicenter" of environmental management in Jamaica, and for this reason above all others strengthening NEPA is fundamental to strengthening environmental governance in Jamaica.

In carrying out its mandate, NEPA works with a wide range of other organizations. In part because of the relationship between NEPA and the Parish Councils regarding development planning and control, and in part because environmental issues often have most direct impact at the local level, the consulting team believes that efforts to strengthen NEPA should also strengthen **key collaborating organizations at the local level**. This includes, in particular, the Parish Councils, the Parish Development Committees, and local organizations involved in the management of protected areas.

The Private Sector

The private sector is not typically considered part of the institutional/governance structure for environmental management in a country. Semantic distinctions aside, it is important to recognize that enhanced capacity of the private sector in the environmental area can make a significant contribution to environmental protection and support enhanced environmental governance.

The consulting team selected the private sector as the second "governance" priority based in part on the important direct linkages with the priorities established in the *IDB Country Strategy for Jamaica*, which lists Private Sector Development as the first pillar of the strategy. In addition, the private sector is the "engine" for much of the economic development anticipated in Jamaica's MTSEFP. A focus on private sector environmental capacity therefore links very directly to some of Jamaica's key development priorities.

The balance of this section provides elaboration of selected governance issues, first for NEPA and key collaborating organizations at the local level, and second for the private sector. The issues presented were drawn from Table 6.1. The discussion is indicative and does not necessarily cover all key governance issues.

6.2.3 Governance Issues: NEPA and Local Agencies

Table 6.2 presents selected governance issues for NEPA and key collaborating organizations. For background information relating to these issues, refer to the appropriate section in Chapter 4.

Table 6.2: Selected Governance Issues for NEPA and Key Collaborating Organizations

No current overarching environmental policy	In 2001 Jamaica began development of a National Environment and Planning Policy and Strategy (NEPPS), but this process was not completed. Furthermore, no national sustainable development strategy currently exists. As a consequence, the linkages between the overall planning framework, the MTSEPF, and the environmental sector are weak. Although environmental sustainability is cited as Goal #7 in the MTSEPF, no policies are directly linked to this goal. In the past the national environmental action plan (JaNEAP) was the planning instrument used to address this gap. The last JaNEAP was for the period 1999-2002. Senior officers at NEPA and at the MLGE indicate that Jamaica will review the need for an environmental policy, under which the JaNEAP would be the 3-year action plan to implement this policy. Such a policy should include key environmental principles such as the "polluter pays" principle, the "user pays" principle and the "precautionary" principle. This policy could be the guiding document for the environmental pillar of the National Development Plan (NDP) process which started in November 2006 at PIOJ.
Most thematic environmental policies are not finalized	Most thematic environmental policies are in "green paper" form (or are drafts not yet issued as green papers). Only two environmental policies and the related Forest Policy are in "white paper" form (i.e. finalized). In addition, some of the implementation processes guided by these policies are not the direct responsibility of NEPA, and the responsible agencies were not necessarily involved in policy development. Although NEPA is not prevented from implementing draft policies, a set of well developed and approved environmental policies would strengthen NEPA's capacity to manage, conserve, and protect the environment. Such policies would also formalize and strengthen collaboration with other ministries/agencies with mandates relevant to the approved policies, such as the Forestry Department and the Water Resources Authority.
Legislative framework not adapted for NEPA merger	NEPA was created in 2001 through the merger of the NRCA, the Town Planning Department, and the Land Development and Utilisation Commission. NEPA exercises its mandates under the NRCA Act, the Town and Country Planning Act, the Land Development and Utilization Act, and other statutes. Despite the merger process, no update of the legislative framework was undertaken. As a consequence, since 2001 NEPA reports to three Boards and is advised by another Board. This situation is hampering proper development planning and sound environmental management. With ENACT support, NEPA has initiated a review of the legislative framework in the areas of land development, planning and environmental management. The study will make recommendations leading to drafting instructions for new legislation. This initiative is continuing in 2007.
Uneven environmental review and permit and licensing processes	Jamaica has equipped itself with the instruments needed to ensure that environmental reviews are conducted and appropriate permits are issued. However, as a general observation, the EIA process is not operating as effectively as required ensure the sustainability of Jamaica's environment and economy. Some key issues include: • In some instances there is a perception that the process is academic – that agreements are made and sites disturbed before the public review has occurred. • EIA review periods and opportunities are often short, providing insufficient opportunity for study and response. • EIAs on recent hotel projects have been lacking in some technical respects, including assessment of alternatives and assessment of indirect impacts. The limitations of the EIA process are illustrated by the recent experience with the review for the development at Pear Tree Bottom, which showed troubling failures of analysis, information, communication and dialogue.[60] (The Pear Tree Bottom case also demonstrates that Jamaican law allows elements of the EIA process to be brought forward for Judicial Review, and that the results of the review may favour the complainant.)

[60] PIOJ. *Tourism/Bauxite Expansion Study Framework Programme for Action: Tourism Component*. August 2005. Prepared by Alison Massa.

Low capacity for environmental enforcement	Jamaica experiences relatively low levels of compliance and limited enforcement of natural resource, environmental, and planning standards/regulations. Similarly, licenses and permits are not adequately monitored for adherence to conditions. Some of the compliance and enforcement challenges are as follows: • Limited resources are available for enforcement, particularly with respect to the number of trained, properly equipped staff. • Natural resource conservation legislation is contained within the mandates of several GoJ ministries, but no common strategy exists to sustain a satisfactory level of compliance and enforcement under the various Acts.[61] • There is a lack of clarity concerning roles and responsibilities for environmental enforcement between the national agencies such as NEPA and NWC, and local authorities such as the Parish Councils and KSAC. • Penalties are insufficient to the point where convictions are not a deterrent. • Public support is limited due to lack of knowledge of the issues.
Outdated planning framework / need for updated development orders	The current planning legislation in Jamaica is regarded as outdated.[62] The Town and Country Planning Act provides for development control through the "development order" mechanism. Currently development orders do not cover all of Jamaica, and most that do exist are very old (over 40 years in some cases).[63] The general lack of current development orders means that most planning and environmental decisions are made on discretionary grounds. In addition, an estimated 50-70% of all development takes place outside the formal system (i.e. without approval). The Planning Division at NEPA has insufficient resources to develop and maintain up-to-date development orders, or to engage actively with the new participatory consultation process at the Parish level (through the Parish Development Committees). Currently, the planning activity at NEPA is dominated by development control matters which are estimated at 4,000 applications per year (about 75 a week). Local communities also have limited capacity to be full participants in the local planning process. This applies both to the Parish Councils, who have specific authority and responsibilities relating to development control, and to the Parish Development Committees, who potentially provide an important participatory channel at the local level.
Town and Country Planning Act does not "bind the crown"	NEPA's current jurisdiction is over private development on private land; the Town and Country Planning Act does not bind the Crown. Therefore no planning permission is required for developments undertaken by the Government. In addition, the Housing Act and the Urban Development Commission Act give the National Housing Trust (NHT), the Urban Development Corporation (UDC), and the National Housing Development Corporation (NHDC) specific responsibility for planning development with no obligation to consult with NEPA or the affected Parish Council. Because government is a significant player in development in Jamaica, these legislative provisions mean that significant projects can fall outside the authority of NEPA and the development approval processes that it manages.
Availability of environmental data and analysis is limited and fragmented	NEPA is the main custodian for environmental and development planning information in Jamaica, but in the recent years STATIN has also developed its capacity to establish environmental indicators, collect environmental data, and provide access to environmental statistics. Other agencies also collect and maintain environmental data. The Water Resources Authority, for instance, maintains an water resources database. Notwithstanding these initiatives, overall there are significant gaps in the body of current environmental data available in Jamaica, and the data that is available is not necessarily consolidated and readily accessible for analysis. Additional data may become available as

61 ENACT. *Draft Multi-Agency Compliance and Enforcement Strategy for Jamaica*. 2001.

62 See KPMG Consulting LP. *Draft Discussion Paper – A Planning Framework for Jamaica.* 2002. This report provides an analysis of Jamaica's current planning framework and the steps towards a modernized approach.

63 A notable exception is the St. Ann Parish Development Order of 2000, a modern policy-based plan together with a regulatory mechanism similar to a zoning bylaw.

	a result of new air quality regulations (and other future regulations); this will require additional resources for environmental information and data management at NEPA.
Agencies have difficulty meeting international agreement obligations	Jamaica is a signatory to most of the major multilateral environmental agreements. However, the recently completed national capacity self-assessment[64] indicates that the relevant national institutions do not have the required resources (human and financial) to fully implement the respective national action plans. Additionally, the lack of adequate information, the insufficient coordination among agencies, and the need for better mainstreaming of these agreements into the national policy framework are major capacity issues preventing Jamaica meeting the country's obligations.
Sustainable management of protected areas is uncertain	A small number of NGOs have been delegated authority to manage protected areas. This management approach is innovative and strongly supported by stated government policy, but it is confronted by significant sustainability challenges. The financial resources required to properly manage these areas has not been provided by government or other organizations, and user fees cannot be expected to cover a significant portion of the costs (at least in most of the protected areas). In addition, long term management of these areas requires significant long term capacity in the delegated authority NGOs, and this capacity has been difficult to build in the absence of adequate financing.

The discussion above in Table 6.2 and the earlier discussion in Chapter 4 support two important and related observations:

- The environmental governance challenges within NEPA and its collaborating organizations are important and need to be addressed on a priority basis if Jamaica is to benefit from a strong environmental management regime.
- Notwithstanding the very real challenges, NEPA is an established organization with staff, budget, and various policy, legislative, regulatory, and other management tools at its disposal. The foundation that is needed to build a strong environmental management regime is in place.

NEPA has secured resources and begun to address certain of the issues identified in Table 6.2 (notably the legislative framework study and work leading to new Development Orders in some parishes). But the needs remain large, and there is a significant opportunity for the IDB and/or other organizations to make a contribution in this area. Based on the issues raised in Tables 6.1 and 6.2, some of the areas in which assistance could be provided include:

- Development of overall environmental policy and finalization of thematic policies
- Completion and implementation of the updated legislative framework for NEPA
- Strengthening the EIA and permit and licensing processes
- Strengthening environmental enforcement
- Updating and strengthening development planning and control
- Strengthening collection, management, and distribution of environmental data
- Strengthening policy and technical capacity
- Strengthening capacity of NEPA/GoJ to meet international agreement obligations
- Strengthening capacity of NEPA to engage with partner organizations
- Strengthening capacity of local partner organizations collaborating with NEPA (Parish Councils, PDCs, delegated authority NGOs)
- Support for strategic studies and analyses (e.g. costs of environmental damage).

These concepts are further developed as **Recommendation #1,** presented in Chapter 7.

[64] National Environment and Planning Agency. *National Capacity Self-Assessment Report.* National Capacity Self Assessment Project. September 2005. www.nrca.org/projects/ncsa/index.htm

6.2.4 Governance Issues: The Private Sector

Table 6.3 presents the key environmental "governance" issue for the private sector. For further background information relating to environmental matters in the private sector, refer to Section 4.9 of this report.

Table 6.3: Selected Environmental Governance Issues for the Private Sector

Private sector companies have limited capacity to improve environmental performance	The capacity of private sector companies to respond to new government environmental requirements and initiatives varies across companies, but in general both technical and financial capacity is low. This means that companies may be challenged in their efforts to comply with requirements, but it also means that they may be unaware or unable to afford significant opportunities to reduce costs and/or expand markets through environmental improvements. Company specific advice, supported by access to low cost financing, can be expected to play a catalytic role in stimulating company action. This type of program can have secondary spin-off benefits as well: by creating a demand for environmental products and services, business opportunities are provided for local companies wishing to participate in the environmental marketplace.

The discussion above in Table 6.3 and the earlier discussion in Chapter 4 suggest that there is a opportunity for the IDB and/or other organizations to help strengthen private sector environmental management. Specifically, two areas in which assistance could be provided are:

- Provision of on-site environmental audits and tech support to identify and help companies implement pollution prevention and efficiency opportunities
- Provision of low cost capital to enable investments in efficiency, clean technologies, and other environmentally beneficial alternatives.

These concepts are further developed as **Recommendation #2,** presented in Chapter 7.

6.3 KEY ENVIRONMENTAL ISSUES

As noted in Section 6.1, and notwithstanding the overarching importance of governance, many specific environmental issues are also of critical importance and warrant action in the near term. Environmental stressors affect a wide range of human and natural resources. For existing issues, action now can mitigate impacts that may already be significant. For emerging issues, action now can help avoid or reduce problems before they become significant.

In principle, selection criteria can provide a rational basis to move from a long list of important issues to a manageable set of defined priorities. In practice, there is no definitive basis for determining which stressors or which issues are "most important" in Jamaica.

Instead, the consulting team adopted an approach based on judgment of the team, tested iteratively with Jamaican stakeholders. Specifically, the team:

- Sought stakeholder views concerning the most important environmental issues
- Informally tested the identified issues relative to a set of screening criteria (Table 6.4)
- Considered the framework provided by the *IDB Country Strategy*
- Considered the portfolio of recent and current IDB loans and other projects.

In the end, the priority issues proposed in the text below were all identified by stakeholders; are all clearly significant relative to the screening criteria; and all fit directly or indirectly with the *Country Strategy*.

Moreover, these issues are all clearly related to recent and/or current Bank projects in Jamaica. This last point is significant: for reasons of continuity, experience, and presence, it makes sense to focus first on established areas of Bank engagement, if the environmental need remains strong.

Table 6.4: Screening Criteria

What resources are at risk, and how significant is the risk? o Human populations, including marginalized groups o Urban and rural communities o Marine & coastal resources (coral reefs, wetlands, Kingston Harbour, etc.) o Watersheds (soil erosion, water quantity & quality, etc.) o Protected areas (including areas not yet protected e.g. Cockpit Country) o Biodiversity o Global commons (e.g. atmosphere, climate)
Environmental costs and benefits
Socio-economic costs and benefits
Immediacy, impact/frequency
Extent of current response (is the issue already controlled?)
Linkage to the Millennium Development Goals.

Based on this process and rationale, the proposed priority environmental issues for possible Bank engagement are as follows:

- **Solid waste management**
- **Wastewater treatment**
- **Climate change adaptation.**

The first two of these issues – solid waste and wastewater – are existing environmental challenges of great importance in Jamaica. Historically, the Bank has been strongly engaged in both of these areas (a topic that is discussed further in the Chapter 7). The third issue – climate change adaptation – is an emerging challenge of great potential significance to Jamaica, where there is an opportunity for proactive contribution. Climate change adaptation has a strong connection to the third pillar of the *Country Strategy,* which focuses on natural disasters. These concepts are further developed as **Recommendations #3, 4, & 5,** presented in Chapter 7.

In addition, our cross-sectoral analysis has identified an additional significant opportunity:

- **"Green" Fiscal Reform and Tax Shifting**

In order to manage the debt, GDP growth will be emphasized by the GoJ, with specific expansion targeted in the main productive sectors. With the expansion of these sectors, there will be benefits associated with this economic growth including employment, foreign exchange earnings and government revenue. However there will also be costs, including high levels of resource use and environmental damages. In addition, there will be an increasing need for fiscal outlays to finance environmental governance in agencies such as NEPA; to manage natural resources such as land and water; to provide water and wastewater services; and to address increasing volumes of solid waste.

When these various drivers are evaluated, a policy development opportunity emerges that adds a broad programme of "green" tax reform to current IDB and GoJ tax reform initiatives. Under an expanded tax reform programme the objective would be to seek opportunities that promote environmental, social and economic development *and* contribute to the fiscal objectives of the GoJ. This concepts are further developed as **Recommendation #6,** presented in Chapter 7.

CHAPTER 7. DRAFT RECOMMENDATIONS FOR BANK SUPPORT

7.1 INTRODUCTION

This final chapter recommends a small number of pragmatic and well justified environmental actions the bank could undertake in Jamaica over the next 4-5 years. As specified in the CEA Terms of Reference, these recommendations:

- Build on past efforts and complement ongoing and planned activities
- Take account of the strategic priorities of the GoJ, the Bank, and other stakeholders
- Address key environmental opportunities and risks
- Include actions that lay the foundation for future operations, including policy, regulatory, and other reforms that have high impact but low cost.

Please note that the recommendations presented here are drafts for discussion purposes. Following review by the Bank and by stakeholders, and following discussion in the January 2007 stakeholder workshop, these recommendations will be revised and finalized.

The balance of this chapter is organized as follows:

- **Section 7.2** presents a brief overview of the environmental initiatives of other bilateral and multilateral assistance programmes in Jamaica
- **Section 7.3** summarizes the draft recommendations for Bank support
- **Section 7.4** details the draft recommendations for Bank support
- **Section 7.5** presents further recommendations for consideration.

7.2 OTHER BILATERAL AND MULTILATERAL ASSISTANCE PROGRAMS

A considerable number of bilateral, multilateral, and other international agencies have in the past provided assistance relating to environmental management in Jamaica. Examples include:

- Bilateral: USAID, CIDA, EU, EFJ.
- Multilateral/International: World Bank, GEF, UNEP, UNDP.

Before presenting the draft recommendations, it is therefore useful to consider the current priorities of the various other international agencies involved in the environment sector in Jamaica. This overview is intended to provide additional context for the recommendations; to demonstrate that the CEA recommendations are neither redundant nor conflicting with the programs of the other agencies; and to identify areas of possible synergy where these exist.

For this purpose, the consulting team compiled agency information available on the internet, and met with several of the key agencies still active in the environmental area in Jamaica. The general conclusions that can be drawn based on this review are as follows:

- A number of program initiatives supported by the various agencies address specific environmental needs in Jamaica, but overall the level of involvement is modest in absolute terms, and significantly reduced relative to the recent past.

- The initiatives that are in place or planned are generally specifically targeted (e.g. USAID focuses exclusively on biodiversity and related issues).
- Major areas of need are not currently addressed in a significant way by any donor or other international agency (e.g. solid waste).
- In short, many opportunities remain to make a positive environmental contribution in support of Jamaica's current development priorities and plans.

Annex 3 presents a summary table outlining the priorities of the major donor organizations involved in the environment sector in Jamaica.[65]

7.3 DRAFT RECOMMENDATIONS: SUMMARY

Based on the analysis in Chapter 6 and the consultative process outlined in Chapter 1, the consulting team had developed draft recommendations for Bank support in six areas:

Governance

- Recommendation #1: Support the strengthening of NEPA and agencies with which it interacts, in particular at the local level
- Recommendation #2: Support private sector access to low cost capital for investments in environmental protection.

Stressors

- Recommendation #3: Provide renewed support to address solid waste management issues
- Recommendation #4: Support new initiatives to address wastewater management issues
- Recommendation #5: Expand Country Strategy focus on natural disasters to include adaptation to the impacts of climate change.

Mainstreaming

- Recommendation #6: Support "Green" Fiscal Reform and Tax Shifting.

Each of these recommendations is elaborated in Section 7.4.

7.4 DRAFT RECOMMENDATIONS: DETAIL

The package of draft recommendations that has been developed by the project team is presented below. For each recommendation, a series of relatively short term actions has been proposed, in most cases building to a larger long term initiative. This step-wise approach arises from a number of considerations:

- As outlined in Section 2.2, the *IDB Country Strategy* anticipates a program of modest scale in Jamaica in the near term, with limited public sector investment lending (focusing instead on policy-based lending, grant modalities for catalytic actions, and private sector

[65] Annex 3 to be provided in the final draft of this report.

lending). The *Strategy* anticipates that smaller scale activities in the near term can play a catalytic role, laying the foundation for greater engagement in the future.

- In the case of certain of the proposed initiatives (notably solid waste), the experience with recent IDB loans in the sector has been problematic, ending with cancellation of the loan and unachieved objectives. Notwithstanding this experience, re-engagement in these areas is important, but a step-wise approach is warranted. Initial modest projects can help meet specific immediate needs while also building the preconditions for an expanded future engagement. This is a "no-regrets" strategy, providing short term benefits regardless of whether the longer term opportunity proves to be feasible.

- In the case of other proposed initiatives, the initiative involves new partners for the IDB. In these cases, a step-wise approach offers a mechanism to build the working relationship and mutually define the character of a possible larger future engagement.

The recommendations are elaborated in turn below. For each, the text presents a summary of the suggested short term and long term actions, the rationale, a more detailed description, and additional notes.

<table>
<tr><th colspan="2">Recommendation #1: Support the strengthening of NEPA and agencies with which it interacts, in particular at the local level (local government, Parish Development Committees, delegated authority NGOs)</th></tr>
<tr><td>Short term</td><td>Support NEPA needs assessment (mandate, structure, relationships, operations, capacity) and best practices review</td></tr>
<tr><td></td><td>Support “Quick Start” initiatives:
• Candidate 1: Analytic study assessing the annual costs of environmental degradation (GDP impact)
• Candidate 2: Creation of an environmental data/information system and repository (linked to existing databases such as the one maintained by the WRA)
• Candidate 3: Personnel support (e.g. senior cooperants for key HR gaps)
• Candidate 4: Preparation of a development plan in a pilot parish based on best practice planning approaches
• Candidate 5: Demonstration project with a selected protected area focusing on mechanisms for sustained financing
• Candidate 6: Other high priority actions based on findings of the needs assessment</td></tr>
<tr><td>Longer term</td><td>Build towards possible policy-based loan supported by substantial TC grant</td></tr>
<tr><td colspan="2">Rationale

• See discussion in Chapter 6 (Section 6.2).

Description

• The NEPA needs assessment would provide the primary basis for design of a long term strengthening initiative.
• The best practices review would consider international models for key challenges (enforcement, protected areas, etc.).
• The candidate short term initiatives are concepts only, for further development and dialogue (see notes below for further comments).
• The long term strengthening initiative would focus on the issues discussed in Section 6.2.3, updated and refined based on the needs assessment, best practices review, and results of any implemented “quick start” initiatives.

Notes

• Candidate 1: Study results can be expected to provide quantitative support for increased investment in environmental protection.
• Candidate 2: Design should take account of experience to date in Jamaica, including strengths, weaknesses, and lessons learned in earlier data sharing initiatives.
• Candidate 4: This initiative can be expected to demonstrate and enable improved local planning and development control, ideally in an parish experiencing development pressure (bauxite, tourism). The initiative also provides an opportunity to link disaster prevention/management to land use planning.
• Candidate 5: Financial sustainability is the greatest constraint to the protected areas system at present. The demonstration project would attempt to address this challenge, and could inform a broader review of protected areas management.</td></tr>
</table>

Recommendation #2: Support private sector access to low cost capital for investments in environmental protection	
Short to medium term	Design and establish a low interest revolving loan fund, integrated with on-site technical advisory assistance, to support investments in environmental protection including environmental management systems, pollution prevention practices, cleaner technologies, efficient technologies and practices, and pollution control

Rationale

- See discussion in Chapter 6 (Section 6.2).

Description

- This initiative provides an integrated approach combining low interest loans with pro-active advisory services. (Loans alone are likely to achieve relatively little.)
- For private sector companies subject to the new air regulations (or other future regulations) this initiative is likely to increase compliance, maximize emission reductions, and minimize costs.
- For other companies, this initiative will facilitate voluntary investment in selected new technologies and plant optimization in order to reduce both emissions and costs.
- Program eligibility should be contingent on company intent to achieve or exceeding environmental compliance.
- Program design should take account of previous experience and lessons learned with other private sector loan programs.
- Delivery mechanisms are to be determined. For the loan component options include existing financial institutions (non-exclusive arrangements) and/or private sector associations. For the advisory services options include standing offers with qualified firms, engagement of the university-based specialists, etc.
- As a complementary initiative, environmental elements could be added to other existing loan programs (e.g. increased loan eligibility for projects involving clean technology).

Notes

- Funding for this initiative may fit within the mandate of the Multilateral Investment Fund
- This loan program should not provide subsidized capital for projects that increase resource use. Subsidization of water supply systems, for instance, leads to muted price signals and hence to over use of a scare resource.

Recommendation #3: Provide renewed support to address solid waste management issues	
Short term	Support initial research as platform for renewed dialogue and possible engagement: • Candidate 1: Update study on required institutional, policy, & legislative arrangements • Candidate 2: Analytic study assessing the environmental costs of the current system • Candidate 3: Study of the technical and economic feasibility of recovery of waste streams
	Support consultation on future priorities
	Support capacity building activity as required to establish pre-conditions for possible future loan
Longer term	Build towards possible future investment loan in support of improved solid waste management (including hazardous and special wastes)

Rationale

- The IDB has in the past been extensively involved waste management initiatives in Jamaica, with poor results overall (see Table 2.4 in Section 2.2.2).
- However, waste management is a pressing priority issue in Jamaica (see Chapter 6), and consequently re-engagement by the IDB is desirable if pre-conditions for success can be established (based on lessons learned from the previous engagement).
- This recommendation proposes step-wise re-engagement building towards a possible future investment loan. Each step in the process would be designed to help build the required preconditions, and each step would involve "no regrets" initiatives (valuable regardless of whether a larger long term program emerges).

Description

- The scope of a future loan remains to be determined, but Jamaica requires major upgrades in waste management at all levels. This includes collection and proper disposal of domestic wastes, recovery for recycling and/or reuse of fractions of the waste stream, and sound management of hazardous and special waste streams.

Notes

- The IDB Project Completion Report for the recent Solid Waste Management Loan provides insight on challenges and lessons learned. The principal reason for unsatisfactory results was inadequate local budgetary support for the project. Other issues of significance included difficulties concerning implementation of a user pay system. These are among the issues that would need to be resolved prior to re-engagement on a large scale.

Recommendation #4: Support new initiatives to address wastewater management issues	
Short term	Support initial research: Study on required institutional, policy, & legislative and fiscal arrangements
	Support consultation on future priorities
Longer term	Build towards possible future investment loan in support of improved wastewater management

Rationale

- Wastewater is a high priority issue in Jamaica (see Chapter 6); in the absence of adequate wastewater treatment Jamaica's development will be compromised.
- IDB has interest in wastewater and related projects. The current Kingston Metro Water Supply Rehabilitation Project includes a component supporting development of a sewage treatment action plan (this component may no longer be required).

Description

- This recommendation proposes initial short term initiatives to establish the foundation for a possible future investment loan.
- The scope of a future loan remains to be determined, but Jamaica requires major investment in wastewater collection and treatment. Priorities include expansion of the collection system island wide and construction of new treatment facilities, particularly in coastal towns; rehabilitation and upgrade of facilities to meet new standards; and improved operational practices.

Notes

- Sewage treatment is an identified priority area of action in *Jamaica's National Programme of Action for the Protection of the Marine Environment from Land Based Sources;* Jamaica's *Water Sector Policy* has the objective of sewering all major towns by 2020.
- Jamaica receives considerable international support in the area of water supply, but more limited support in the area of wastewater.
- A new wastewater and sludge regulation is forthcoming; a reasonable condition prior to approval of a loan would be promulgation of the new regulation

Recommendation #5: Expand Country Strategy focus on natural disasters to include adaptation to the impacts of climate change	
Short term	Support risk evaluation for natural and man-made disasters
	Support development of climate change vulnerability assessments and plans of action (complementing other initiatives)
	Support consultation on future priorities
Longer term	To be determined

Rationale

- Climate change adaptation is an emerging challenge of great significance to Jamaica. There is a need and opportunity for a proactive response to help minimize long term costs.
- Climate change adaptation has a strong connection to the third pillar of the *IDB Country Strategy,* which focuses on natural disasters.
- Climate change adaptation also involves response to long term changes regarding, for instance, sea level rise, water availability, agricultural impacts, and public health impacts.

Description

- The proposed short term activities are designed to help provide a foundation for Jamaica's response to the impacts of climate change, helping to accelerate efforts undertaken to date, and assisting Jamaica to meet obligations under the UNFCCC.
- In the longer term, as an island state Jamaica is likely to require very large investments relating to climate change adaptation. The nature of these investments, and the possible contribution of the IDB, is unknown at this time.

Notes

- Jamaica has prepared a list of recommended climate change projects for inclusion under the GEF Resource Allocation Framework. The list includes three small initiatives related to climate change adaptation: climate scenarios modeling, vulnerability assessment, and city-based adaptation.
- GEF is also responsible for administration of the Special Climate Change Fund (SCCF) and the Adaptation Fund, which may offer greater opportunities for funding adaptation projects in Jamaica. Funding may also be available through the Strategic Priority on Adaptation under the GEF Trust Fund.
- Current regional IDB projects relevant to this initiative include storm surge modeling (draft final report stage) and a planned hazard risk assessment (Bank Action Plan for Disaster Risk Management, described in Section 2.2.2).

Recommendation #6: Support "Green" Fiscal Reform and Tax Shifting	
Short term	In the planned comprehensive tax reform study, include a study of fees, subsidies, and tax shifting as means to reduce environmental impacts while improving the government's fiscal position
Longer term	In the planned policy-based loan: Implement justifiable fee, subsidy, and tax shifts ("green" fiscal reform and tax shifting)

Rationale

- This recommendation proposes to "mainstream" green fiscal reform and tax shifting within two significant initiatives included in the *IDB Country Strategy*: (1) the comprehensive tax reform study and (2) the policy-based loan to support facilitative business climate and tax reform. Specifically, this recommendation proposes to integrate additional elements within these planned activities, in order to achieve important environmental and developmental goals.

- The need for a "green" fiscal and tax reform programme is supported by the twin drivers of an increasing need for pollution control and resource management *and* the tight fiscal situation of the GoJ. Such a programme could produce multiple benefits including: raising revenue to improve environmental governance (user fees); reducing government outlays and increasing revenues (removal of distortionary subsidies and incentives); and influencing behaviour to reduce environmental impacts and promote labour-intensive growth and capital productivity (green taxes).

Description

A green fiscal reform and tax shifting policy package could be sequential and include three elements:

1. *Expand User/Discharge Fees and Strengthen Capacity to Levy*. This element involves strengthening the capacity of various government agencies to more broadly apply discharge fees (such as the Air Discharge Fees in the *Air Quality Regulations 2006*) and user fees that reflect full marginal costs (e.g. for water). This would involve "getting the prices right" so that conservation potential was addressed prior to supply expansion. Broadening and possibly deepening the application of fees would send a signal that emissions and resources have value and decisions should incorporate that value. Increased revenues from an expanded system of fees would support the GoJ's fiscal objectives.

2. *Remove Subsidies and Incentives.* This element addresses distortionary incentives and subsidies that are influencing decisions that are counter to development objectives. Examples in the tourism sector include exemptions from import duties that have led to an increasing share of imports in tourism final demand (import substitution), and some incentives included under the *Hotel Incentives Act.* For example, under this *Act* in 2005, two new large resorts received incentives, including the Bahia Principe resort at Pear Tree Bottom (see Table 6.2), notwithstanding environmental concerns.

   The basic approach in implementing a subsidy and incentive reform initiative would be to first identify sources of tax expenditures that can be related to adverse environmental, social and economic outcomes. Where opportunities exist, subsidy removal or reduction would then be contemplated. Subsidy reduction or removal would ultimately improve the government's fiscal situation (through increased revenue or decreased outlays) while reducing distortionary incentives that potentially lead to sub-optimal development outcomes.

3. *Consider Tax Shifting*. The current tax system impairs the achievement of important private sector policy goals in the *Medium-term Strategy* by distorting labour and capital decisions. Under an expanded programme of tax reform, distortionary taxes would shift away from labour and capital and

onto activities that use resources such as physical infrastructure and natural capital (air, water and waste disposal for example). This tax shifting strengthens the environmental governance framework by transmitting the value of natural capital and influencing decisions accordingly. It also provides additional opportunities to raise revenues to finance infrastructure and help reduce public debt.

Notes

- There are significant challenges associated with an expanded "green" fiscal reform and tax shifting package. The initial study should assess the feasibility, costs, and benefits of these various opportunities.

7.5 ADDITIONAL RECOMMENDATIONS

In addition to the six primary recommendations outlined above, each of which outlines a set of possible new or enhanced initiatives, the consulting team offers the following additional recommendations:

Natural Disasters

The findings of the CEA strongly support Pillar C of the *IDB Country Strategy*: Reducing Vulnerability to Natural Disasters, and strongly support the IDB's efforts to build project activity in this area.

Moreover, the CEA findings suggest expansion of the scope of this pillar in two respects. The first of these changes – inclusion of adaptation to climate change – has been discussed above in Recommendation #5.

The second suggested change is small but significant. As many stakeholders pointed out, there is a strong linkage between natural disasters and other environmental disasters induced by humans. First, many "natural" disasters are in fact caused or exacerbated by human activity. In addition, human activities can be responsible for a distinct set of accidents and extreme events (major oil spills, sudden chemical releases, major contamination of water supplies, etc.). These require many of the same types of prevention, preparedness, and response activities as natural disasters, and warrant consideration in any comprehensive approach to the challenge of minimizing the risk and consequences of disaster. Accordingly:

Recommendation #7: The IDB activities in the area of disasters should encompass both natural and human-induced disasters.

Dialogue

Through the mechanism of this CEA, the Bank has demonstrated the importance it attaches to environmental matters within the context of its engagement in Jamaica. Similarly, as indicated elsewhere in this report, the GOJ has a clear policy commitment to sound environmental management and sustainable development, and recognizes the challenges of achieving these commitments.

Given these facts, increased high-level dialogue between the Bank and the GOJ is warranted. Such dialogue would provide an opportunity to reinforce:

- The importance of mainstreamed commitment to environment in the Bank's partner agencies
- The importance of GOJ coordination of donors to maximize impact of environmental initiatives and interventions.

This dialogue process also offers an opportunity to explore practical issues of mutual interest. This might include, for example, discussion of the possible use of Jamaican EIA mechanisms for Bank projects ("use of in-country systems"), including determination of capacity building activities required to achieve equivalency.

These observations lead to the final general recommendation:

Recommendation #8: The IDB and the GOJ should periodically engage in high-level dialogue specifically on environmental matter, in order to maximize the benefit of the IDB's engagement in Jamaica.

MARBEK
Resource Consultants Ltd.

ANNEX 1

Bibliography

Bass, Steve and Tighe Geoghegan. 2002. *Incentives for Watershed Management in Jamaica: Results of a Brief Diagnostic*. CANARI Technical Report No. 314. July 2002.

Cabinet Office. *Green Paper: The Jamaica Energy Policy 2006 - 2020*

Cabinet Office. *The Jamaica Energy Policy Analysis 2005*.

Cabinet Office. *Annual Report 2005-2006*. Managing for Better Customer Service and Sustainable National Development.

Cabinet Office. *Government at Your Service. Public Sector Modernization Vision and Strategy 2002-2012.* Ministry Paper No. 56. September 2002.

Cabinet Office. *Jamaica 2015*. The Planning Institute.

Cabinet Office. *Scoping Exercise in Preparation of National Sustainable Development Framework For Jamaica. Annexes.* August 4, 2006.

Cabinet Office. *Scoping Exercise in Preparation of National Sustainable Development Framework For Jamaica. Final Report.* July 12, 2006.

Carby, B. *Flooding In Jamaica: Are We Making Progress In Anticipation Of Climate Change?* Office of Disaster Preparedness and Emergency Management, Jamaica.

Claude Davis & Associates. *Policy and Policy Framework for Hazardous Waste Management in Jamaica: Final Report.* Submitted to Ministry of Land and Environment. 2003.

Claude Davis & Associates. *Report For Task B1: Identification And Characterization Of Industries And A Programme Strategy For Enforcing Environmental Discharge Limits From Industrial Polluters That Discharge Into Kingston Harbour.* Prepared For National Environment And Planning Agency. October 2004.

Claude Davis & Associates. *Technical Support Document For The Regulatory Impact Analysis For Trade Effluent And Industrial Sludge Regulations.* Prepared for the National Environment and Planning Agency (NEPA). April 2004.

Claude Davis & Associates and Kaizen Training & Management Consultants Ltd. *Technical Support Document For The Regulatory Impact Analysis For Air Quality Regulations Developed By The National Environment And Planning Agency.* Prepared for the National Environment and Planning Agency. November, 2002.

Davis-Mattis Laleta. *Jamaica's Commitment to the Conservation and Management of Natural Resources: Ten Years in Retrospect*. Discussion Paper. National Environment and Planning Agency. Kingston, Jamaica. 2002.

EC DG Development (European Commission Directorate-General for Development). 2000 (version 1). *Environmental Integration Manual: Towards Sustainability in Economic and Development Cooperation. Brussels*.

Emergency Disasters Database. http://www.em-dat.net/disasters/countryprofiles.php

ENACT. *Draft Multi-Agency Compliance and Enforcement Strategy for Jamaica.* 2001.

Environmental Action (ENACT) Programme, Office of the Cabinet and Ministry of Land & Environment. *Policy on Strategic Environmental Assessment (Draft)*. Jamaica. November 2003. European Commission, Development Directorate General. *Environmental Integration*.

Evelyn, O.B. and R. Camirand. *Forest cover and deforestation in Jamaica: an analysis of forest cover estimates over time.* Intl Forestry Review 5(4), 2003. www.forestry.gov.jm/PDF_files/JA%20Forest%20Cover%20Change.pdf

Forestry Department. *National Forest Management and Conservation Plan.*

Forrest, Denise, Dr. Elaine Fisher. United Nations Development Programme. *National Capacity Self Assessment Report. Final Report.* September 2005.

Freeman, Peter, and Patricia J. Vondal. 2000. *Strategic Environmental Planning in the Development of Country Strategic Plans: A Proposal. Report for the U.S. Agency for International Development Africa Bureau*. Washington, D.C.: USAID.

Global Environment Facility – GEF/United Nations Development Programme – UNDP/Small Grants Programme – SGP. *Country Programme Strategy for the Small Grants Program in Jamaica.* Version 2.

Government of Jamaica. *Action Plan for Development Effectiveness (PRODEV)*. April 12, 2005.

Government of Jamaica. *Forest Policy 2001* (white paper)

Government of Jamaica. *Initial National Communication of Jamaica.* Submitted to the UNFCCC Secretariat November 2000.

Government of Jamaica. *Jamaica National Assessment Report - A Ten-Year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (2004)*

Government of Jamaica. *Millennium Development Goals*. April, 2004.

Government of Jamaica. *National Policy on Ocean and Coastal Zone Management, 2000* (white paper)

Government of Jamaica. *National Strategy and Action Plan on Biological Diversity in Jamaica*. GoJ White Paper, 2003.

Government of Jamaica. *Policy for Jamaica's System of Protected Areas, 1997* (white paper)

Government of Jamaica. Policy Register. *Policies & Legislations that Guide Ministry Operations*, Cabinet Office. April 2006.

Government of Jamaica. *Scoping Exercise in Preparation of National Sustainable Development Framework for Jamaica.* July 2006.

Government of Jamaica. *The Jamaica National Environmental Action Plan (JaNEAP) 1999-2002.*

Government of Jamaica. *Vision Statements and Exercises.* October 2006.

Government of Jamaica/CIDA/ENACT. *Capacity Assessment for the Planning and Development Division National Environment and Planning Agency (NEPA).* April 2003.

Government of Jamaica/IDB. *Final Report of the Kingston Harbour Project Unit.* Institutional Strengthening for Enhancement of the Environmental Management of KINGSTON HARBOUR. Project ATN/SF-8164-JA.

Harvard University, Global Equity Initiative. *Beyond Money: Diaspora Engagement in Development – Case Study 2 of 3 – Jamaica*.

Inter-American Development Bank. *Environment and Safeguards Compliance Policy*. January 19, 2006. Washington, D.C

Inter-American Development Bank. *Environment Strategy Document*. August 2003. Washington, D.C

Inter-American Development Bank. *Indicators For Disaster Risk Management: Application Of The System Of Indicators 1980-2000 (Jamaica). Summary of Results.* December 2004. Manizales – Colombia.

Inter-American Development Bank. *IDB Country Strategy with Jamaica 2006-2009*. August 3, 2006.

Inter-American Development Bank. Jamaica. *Natural hazard management in urban coastal areas (JA-T1019) Technical cooperation profile.* 27 October 2006.

Inter-American Development Bank. *Jamaica: Strategic Guidelines for Private Sector Development* (JA-P1028) May 2006.

Inter-American Development Bank. *Profile – Civil Society in Jamaica*. 2003.

Inter-American Development Bank. *Program to Support the Implementation of the Bank Action Plan for Improving Disaster Risk Management: 2005-2008 (RS-T1120) Plan of Operations*.

Inter-American Development Bank. *Summary of Project Development Cycle for IDB Projects under the Global Environmental Facility (GEF)*. Environment Division, Sustainable Development Department.

Jamaica Social Investment Fund. *Environmental Management Framework.*

Khosla, Prabha, Beverley Pereira. GOJ/CIDA/ENACT/Jamaica. *Policy and Legislative Frameworks for Sustainable Development: Considerations and Recommendations for Jamaica*. April 2001.

KPMG Consulting LP. *Draft Discussion Paper. A Planning Framework for Jamaica*. March 2002.

Lenschow, Andrea, ed. 2002. *Environmental Policy Integration: Greening Sectoral Policies in Europe*. London: Earthscan.

Lumsden, Richard. Planning Institute of Jamaica. *National Hazard Mitigation Strategic Framework.* May 25, 2006.

Lumsden, Richard. *Vision Statements and Exercises For Jamaica. Final Report.* October 10, 2006. National Sustainable Development Task Force. Cabinet Office.

Maltais, Aaron, Persson, Åsa, Måns Nilsson, Måns, and Segnestam, Lisa. 2002. *Sustainability Impact Assessment of WTO Negotiations in the Major Food Crops Sector: Final Report to EC DG Trade*. May 2002. Stockholm Environment Institute.

Massa, Alison. *Framework Programme of Action: Tourism*. 2006 for PIOJ.

McCatty, Machel & Prudence Serju. *Tourism, Economic Growth & Employment*. 2006. Bank of Jamaica Working Paper. http://www.ccmsuwi.org/Files/amsc/pserju_pap06.pdf

Miller, Learie. National Environment and Planning Agency. *Current and Emerging Issues in Environmental Management.*

Miller, Learie. *Perspectives on the Sustainability of Protected Areas in Jamaica.* Caribbean Geography 10(1).

Ministry of Agriculture and Lands. *The National Minerals Policy: Ensuring a Sustainable Minerals Industry. 3rd Draft.* November 2006.

Ministry of Agriculture. 2005. *Agricultural Development Strategy 2005-2008*. Government of Jamaica, June 2005.

Ministry of Land and Environment. 2002. *Jamaica National Report to the World Summit on Sustainable Development*. Government of Jamaica, Kingston, Jamaica. June 2002.

Ministry of Land and Environment. *National Hazard-Mitigation Policy (Risk Reduction for Jamaica)*. September 2005.

Ministry of Tourism and Sport. *Master Plan for Sustainable Tourism Development: A Synopsis. Government of Jamaica*. September 2002.

Ministry of Transport & Works, Jamaica. *Vision & Mission Statements of the Ministry of Transport & Works*.

Ministry of Transport and Works. *Annual Transport Statistics Report: Jamaica in Figures 2003 – 2004.* Prepared by the Technical Services Unit, Directorate of Policy, Planning & Evaluation.

National Environment and Planning Agency. *Jamaica's National Programme of Action (NPA) for the Protection of the Coastal and Marine Environment from Land-Based Sources of Pollution, 2005-2010*. October 2004. Kingston, Jamaica.

National Environment and Planning Agency. *Corporate Plan 2003-2006*.

National Environment and Planning Agency. *Fourth Quarterly Performance Report: Financial Year 2002-2003*.

National Environment and Planning Agency. *National Capacity Self-Assessment Report.* National Capacity Self Assessment Project. September 2005. www.nrca.org/projects/ncsa/index.htm

National Environment and Planning Agency/ ENACT Programme. *Judicial Symposium 2003 CD*. 2003.

National Environmental Education Committee. *The National Environmental Action Plan for Sustainable Development*. 1998.

National Weather Service, National Hurricane Center. *Deadliest Atlantic Tropical Cyclones, 1492 to 1996* http://www.nhc.noaa.gov/pastdeadly.shtml?

Natural Resources Conservation Authority. *Annual Report 1999-2000*.

Natural Resources Conservation Authority. *Draft Watershed Policy*. 2000. Available at www.nrca.org/policies

Natural Resources Conservation Authority. *Jamaica State of the Environment: The 1997 Report*. Ministry of Environment and Housing. May 1998.

OAS. *Recycling of Industrial Effluent in Jamaica*. http://www.oas.org/dsd/publications/unit/oea59e/ch36.htm

Organisation for Economic Co-operation and Development, Development Assistance Committee. *Good Practice Guidance on Applying Strategic Environmental Assessment (SEA) in Development Co-operation*. DCD/DAC(2006)37, 06-Jul-2006.

Organization of American States. *Economic Analysis of Tourism In Jamaica*. September, 1994.

Pantin, Dennis. *Economic Policy Instruments Study. What and How Economic Instruments Should be Incorporated in Jamaica.* March 27, 2003.

Pereira, Beverley. *Draft Panel Presentation Paper Policy and Legislative Framework for Local Sustainable Development Planning*. November 15, 2001.

Pillai, Poonam. 2002. *World Bank Experience with Country-Level Environmental Diagnostic Tools: Review and Lessons Learned*. Draft. World Bank, Environment Department. Washington, D.C

Planning Institute of Jamaica. *Draft Medium Term Socioeconomic Policy Framework 2004-2007*. February 2005.

Planning Institute of Jamaica. *Economic and Social Survey Jamaica 2005.* April 2006.

Planning Institute of Jamaica. *Economic and Social Survey of Jamaica, 2005* and Bank of Jamaica Statistics www.bankofjamaica.net/economic_data.php?report_id=92

Planning Institute of Jamaica. *Jamaica Survey of Living Conditions 2002*. 2002

Safeguards Diagnostic Review for Piloting the Use of Jamaican Systems to Address Environmental and Social Safeguard Issues in the Proposed World Bank-Assisted Inner City Basic Services for the Poor Project (ICBSP) Equivalence and Acceptability Assessment Report. January 2006.

Segnestam, Persson, Nilsson, Arvidsson, and Ijjasz. SDC (Swiss Agency for Development and Cooperation). 2000. *Integrating Environmental Issues in Planning, Evaluation and Monitoring*. Bern.

Statistical Institute of Jamaica and National Environment and Planning Agency. *Jamaica's Environment 2001: Environment Statistics and State of the Environment Report.* October 2001.

Statistical Institute of Jamaica and NEPA. *Jamaica's Environment 2001*. 2001.

Statistical Institute of Jamaica. *Environment Statistics 2003 and Mineral Accounts.* 2003.

United Nations. *Johannesburg Summit 2002*. Jamaica Country Profile.

Universidad Nacional de Colombia - Sede Manizales and Instituto de Estudios Ambientales. 2004. *Risk and Disaster Risk Management Indicators: Results for Jamaica. Inter-American Development Bank*. Manizales, Colombia, December 2004.

US Army Corps of Engineers. *Mobile District & Topographic Engineering Center. Water Resources Assessment of Jamaica.* February 2001.

World Bank. 2001. *Making Sustainable Commitments: An Environment Strategy for the World Bank*. Washington, D.C. 2002.

MARBEK
Resource Consultants Ltd.

ANNEX 2

Participating Stakeholders

[to be included in the final draft]

MARBEK
Resource Consultants Ltd.

ANNEX 3

Bilateral And Multilateral Assistance Programs

[to be included in the final draft]