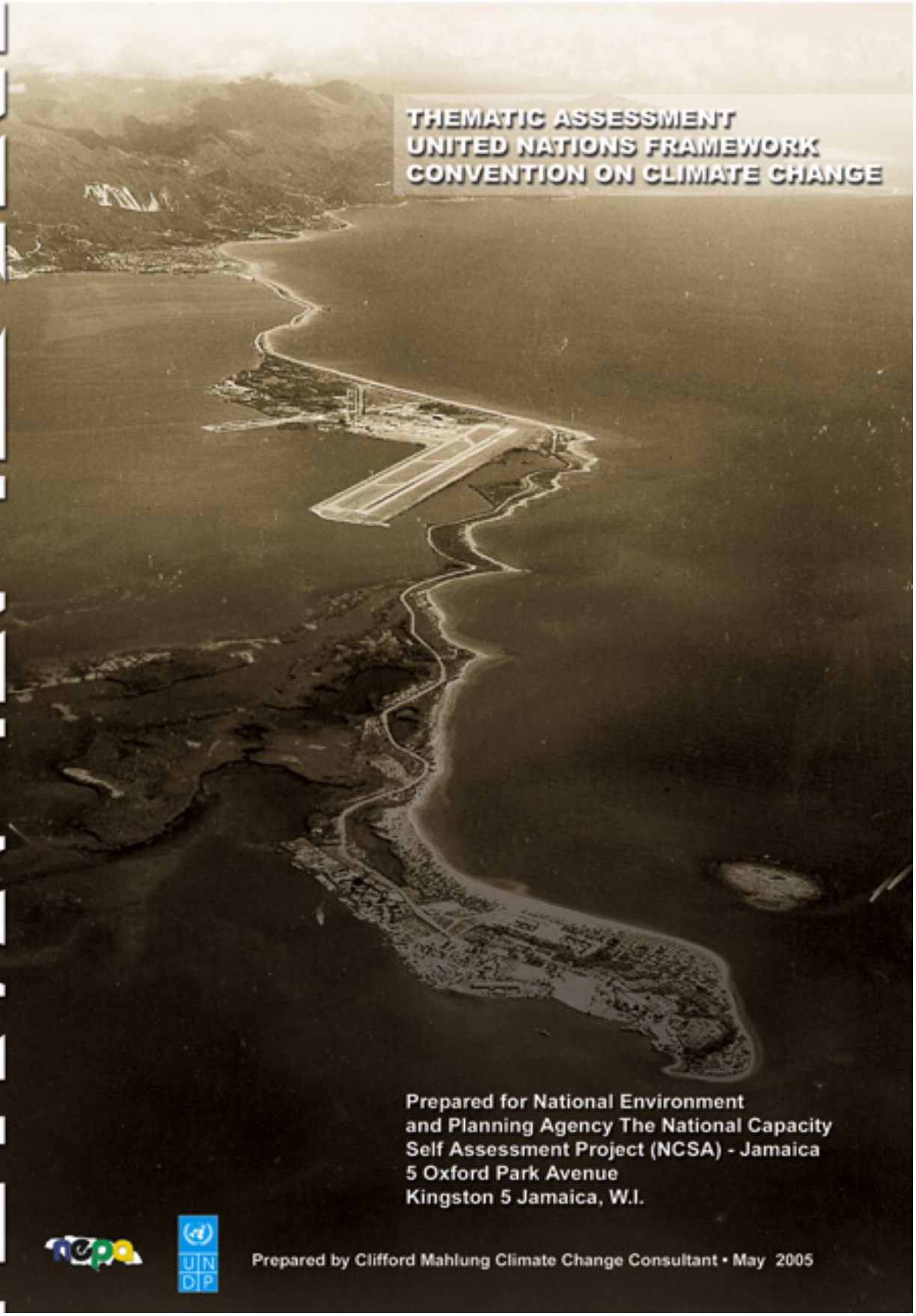
FINAL REPORT

THEMATIC ASSESSMENT UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE



Prepared for National Environment
and Planning Agency The National Capacity
Self Assessment Project (NCSA) - Jamaica
5 Oxford Park Avenue
Kingston 5 Jamaica, W.I.

Prepared by Clifford Mahlung Climate Change Consultant • May 2005

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THEMATIC ASSESSMENT REPORT

United Nations Framework Convention
On Climate Change
(UNFCCC)

Prepared for

National Environment and Planning Agency
National Capacity Self-Assessment Project (NCSA)- Jamaica
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF BOXES

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LIST OF ACRONYMS

ACCC Adapting to Climate Change in the Caribbean

AOSIS	Alliance of Small Island States
CBD	Convention on Biodiversity
CCD	Convention to Combat Desertification
CDM	Clean development mechanism
COP	Conference of the Parties
CPACC	Caribbean Planning for Adaptation to Climate change
CPU	Central Planning Unit
CSGM	Climate Studies Group Mona
DNA	Designated National Authority
FAO	Food and Agriculture Organization
FPI	Focal Point Institution
GEF	Global Environment Facility
GHG	Greenhouse gas
GRULAC	Group of Latin America and the Caribbean
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
JCCEA	Jamaica Climate Change Enabling Activity Phase II
KP	Kyoto Protocol
MACC	Mainstreaming Adaptation to Climate Change
MW&H	Ministry of Water & Housing
NAP	National Action Plan
NCCC	National Committee on Climate Change
NCSA	National Capacity Self-Assessment
NEPA	National Environment Planning Agency
NGO	Non-governmental organization
ODPERC	Office of Disaster Preparedness & Emergency Relief Coordination
ODPEM	Office of Disaster Preparedness & Emergency Management
OECD	Organization of Economic Cooperation & Development
PIOJ	Planning Institute of Jamaica
PSMP	Public Sector Modernization Program
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technical Advice
SIDS	Small Island Developing State(s)
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UWI	University of the West Indies
UWICED	University of the West Indies Centre for Environment & Development

EXECUTIVE SUMMARY

Jamaica is a Party to the UN Conventions on Climate Change, Combating Desertification, and on Biological Diversity. In some cases, the progress in implementing these conventions has not been optimal. The purpose of the National Capacity Self-Assessment Project (NCSA) is to provide Jamaica the opportunity to conduct a thorough self-assessment and analysis of national

capacity needs, priorities and constraints with respect to its efforts at meeting global environmental management objectives. It will facilitate stakeholder consultation in a process of stocktaking, sequencing, identifying and prioritizing capacity needs.

The National Capacity Self-Assessment within the thematic area of Climate Change reviewed Jamaica's implementation of the UNFCCC with a view to identifying priority areas for action to facilitate better implementation.

The objectives of the thematic profile were to identify:

- priority issues;
- capacity constraints for these issues at various levels (systemic, institutional and individual); and
- opportunities for capacity building to address the identified constraints.

Jamaica became a Party to the UNFCCC in January of 1995. In conducting the assessment to evaluate the country's capacity to effectively implement the UNFCCC and identify the capacity constraints, the consultant used questionnaires, interviews with the relevant stakeholders, obtained information provided on several websites, reviewed several publications and compact disks including the first national communication of Jamaica and as well as personal knowledge (having actively participated in the process for five years).

Since becoming a Party to the UNFCCC, Jamaica has implemented climate change activities at the regional and national levels. These are:

- participated in the Caribbean Planning for Adaptation to Climate Change (CPACC), regional project;
- submitted first national communication;
- participated in the Adapting to Climate Change in the Caribbean (ACCC) regional project;
- participate in the Mainstreaming Adaptation to Climate Change regional project; and
- executing Climate Change Enabling activities expedited funding in Priory Areas project.

Additionally, in August 2004 through the expedited financing for capacity building interim funds of US $100,000 were obtained for maintaining and enhancing the capacity to prepare future National Communications. The project is being implemented by the Meteorological Service over twelve months and the main activities are:

- Identification and submission of technology needs;
- Capacity building to assess technology needs, modalities to acquire and absorb them, design, evaluate and host projects;
- Capacity building for participation in systematic observation networks; and
- Preparation of programs to address climate change.

However, despite some attempts Jamaica has since it signed the Convention thirteen years ago not achieved as much as could have been reasonably expected on the given time frame. The main reason for this may be the lack of sustained focus on climate change activities perhaps due in part to the absence of the Climate Change Committee to guide and focus the country's programmes. It must also be noted that the country has not fully articulated its climate change

programme and there re is not significant budgetary support for climate change programmes in Jamaica. This absence of clarity has perhaps resulted in missed opportunities to access funds to assist the country in its programmes. While admittedly there is significant competition for climate change funding- the funds that the country has received to date suggest that we have not fully exploited these funding mechanisms.

Findings

The following are the findings of this assessment:

- the Meteorological Service has never operated as the institution with sufficient authority with respect to the implementation of the convention. This function has been shared at various times between the GEF Focal Point, the Ministry of Foreign Affairs and Foreign Trade and whoever is the parent Ministry of the Meteorological Service (MS)[1];
- there is a strong consensus for the development of a national climate model. This would be used for impact model studies whose outputs are needed for national planning;
- a national Climate Change Committee would be able to provide answers to these questions.
- activities are undertaken in several agencies without any synergy or coordination;
- institutions are unaware of climate change concerns and the fact that there is a role for them in the implementation of the Convention;
- some of the human resources that is require is present in the institutions, some skills are lacking. The problem is that these resources are not tailored to fit the needs for implementation of obligations. A quantum leap is required to transform these institutions to achieve the dual purposes of meeting their original requirements and the new ones that the UNFCCC brings. This will require both training and financial incentives as job descriptions are transformed; and
- a needs assessment of the human resources needs of each institution is required. Such an assessment is beyond the scope of this study.

In addition to these major findings on a number of bottle necks which have hindered Jamaica's Climate Change Programme. They are:

- no climate change secretariat established;
- no functioning National Climate Change committee;
- relocation of Meteorological Service from Ministry to Ministry;
- reduced capacity in the Meteorological Service from time to time due to extended periods of training and no additional personnel enlisted in temporary capacity to alleviate the loss; and
- the need for a mass based public awareness campaign. No public awareness/education program has been developed to address climate change. Some initiatives such as brochures produced by the Meteorological Service have been attempted. These are in short supply due to unavailability of funds to produce in meaningful quantities.

Capacity Constraints

[1] Conversation with Focal Point Mr. J Spooner.

The issues presented for priority attention are the outcomes of several consultations with some of the relevant stakeholders. Constraints at the individual level was inadequate training particularly in the areas of vulnerability assessments and adaptation measures. At the institutional level capacity constraint were:

- inadequate staff complement;
- lack of equipment;
- weak organisational structure; and
- insufficient funding.

At the systemic level the constraints are:

- low priority issue and unclear policy guidance; and
- insufficient funding.

United Nations Framework Convention on Climate Change

1.0 INTRODUCTION

1.1 Background

"It is significant to note that although many vulnerability assessment methodologies have been applied to different regions of the world with varying degrees of success, global assessments have consistently identified the small island states as one of the most high-risk areas, irrespective of methodology employed."[2]

This means that Jamaica and the other small islands are among the countries most vulnerable to the projected effects of a change in the global climate system. The most significant and immediate consequences are likely to be related to:

- Changes in sea levels,
- Rainfall regimes,
- Soil moisture budgets,
- Prevailing winds (speed and direction) and
- Short-term variations in regional and local patterns of wave action.

The Government of Jamaica responding to the imminent threat that climate change posed achieved two significant milestones in the early nineties. The first was the signing of the United Nations Framework Convention on Climate Change (UNFCCC) in Rio de Janeiro in 1992. The second was the country's participation in the first regional climate change project Caribbean Planning for Adaptation to Climate Change (CPACC) that was conceptualized in 1994 in Barbados at the first Conference for Small Island Developing States.

1.2 Frame Work Convention on Climate Change

The United Nations Framework Convention on Climate Change was adopted at the United Nations Headquarters, New York in May 1992 with the ultimate objective of stabilizing the greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human) interference with the earth's climate system. This level of stabilization should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner[3].

The text of the Convention was opened for signature at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil in June 1992. Thereafter it was placed at the United Nations Headquarters, New York and entered into force on 21 March 1994. There are 189 Parties to the UNFCCC[4].

Subsequently, Jamaica became a Party to the UNFCCC in January of 1995 the result of an Act of Parliament.

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[2] Executive Summary of Chapter 17: Small Island States section on Impacts, Adaptation and Vulnerability of the Third Assessment Report of the Intergovernmental Panel on Climate Change.
[3] Article 2 UNFCCC Convention on Climate Change
[4] July 2004

1.3 Kyoto Protocol

The Kyoto Protocol (KP) to the UNFCCC was adopted five years after the signing of the Convention, and culminated two and a half years of negotiations at the third Conference of the Parties (COP 3) in Kyoto, Japan, on 11 December 1997. This historic decision was taken by consensus by over 150 Parties to the Convention and its main focus is legally-binding emission limitation and reduction commitments for Annex I Parties (developed countries) covering all 6 main greenhouse gases (Carbon dioxide, Methane, Nitrous oxide, Hydroflorocarbons**,** Perfluorcarbons, Sulphur fluoride).

The target for each Annex I Party (taken, with a few exceptions, from 1990 levels) is listed in Annex B of the Convention and ranges from a reduction of eight (8%) for 27 Parties to an increase of ten percent (10%). If all Annex I Parties meet their targets, the overall reduction in emissions from 1990 levels for that group will be around five point two percent (5.2%).

It was opened for signature in March 1998 at United Nations Headquarters, New York and entered into force on the ninetieth day after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession. Additionally, those Parties depositing their instruments must include Annex I Parties accounting for a total of at least fifty five (55 %) of their total carbon dioxide emissions for 1990. A total of 124 countries has signed, ratified, accessed or accepted the KP representing forty four point two 44.2% of Annex I targeted emissions[5], ten point eight 10.8 % less than the critical value for entry into force. The Russian Federation ratified the KP which will enter into force in February 2005.

[5] July 2004

2. METHODOLOGY

The National Capacity Self Assessment for Global Environmental Management is a GEF funded project implemented by the United Nations Development Programme and executed nationally by the National Environment and Planning Agency (NEPA).

The project is intended to allow the country to assess and evaluate the status of its efforts to fulfill the environmental obligations of the three Rio Conventions (Climate Change, Biodiversity and Land Degradation). A critical step in this evaluation is the thematic assessments which are intended to examine the achievements to date and identify capacity issues including systemic bottlenecks which are hindering Jamaica's efforts to meet its commitment to the Conventions.

The outcomes of the thematic assessments are as follows:

- Build national capacity to mainstream related issues into general planning and strategy formulation.
- Identify ways to coordinate and harmonize overlapping activities among the three Conventions and to help ensure effective national measures to protect the global environment;
- Prepare a comprehensive national action plan focused on capacity building that will identify follow-up projects, overall goals, specific objectives to be achieved and course of action;
- Support the transition from this enabling activity to the implementation of identified follow up measures to address the effects of climate change;
- Enhance general national awareness and knowledge about the three Conventions and their inter-relationship;
- Strengthen dialogue, information exchange and cooperation among all relevant stakeholders including governmental, non-governmental, academic, and private sectors.

In this regard the GEF Secretariat with the assistance of UNITAR in collaboration with UNDP, UNEP, the World Bank, FAO, UNDIO, and the Secretariats of CBD, CCD and UNFCCC prepared a document[6] to provide guidelines for conducting the assessment which was reviewed by the consultant and where the tools were relevant to conducting the assessment.

Additionally in conducting the assessment the consultant used questionnaires, interviews with the relevant stakeholders, obtained information provided on several websites, reviewed of several publications and compact disks including the first national communication of Jamaica and as well as personal knowledge (having actively participated in the process for five years) to prepare this report. See **Appendix I** for survey questionnaire.

[6] A Guide for Self-Assessment of Country Capacity Needs for Global Environmental Management

3.0 IMPLEMENTATION FRAMEWORK

3.1 Overview

The UNFCCC is a voluntary Convention hence Parties are allowed to implement activities based on their national circumstances and priorities. Implementation particularly in the case of developing country's is also dependent on the availability of funds provided by the Parties included in Annex II of the Convention.

The implementation framework of the Convention recognizes two distinct groups of Parties and as Such common but differentiated commitments. The groupings are termed as "Annex I" and "Non-Annex I Parties".

Parties included in Annex I are the industrialized countries that in 1992 were members of the Organization for Economic Co-operation and Development (OECD) and those countries with their economies in a state of transition from developing to developed.

Non-Annex I Parties include those countries that are categorized based on per capita earnings as developing countries. The vast majority of these countries are referred to within the United Nations forum as "The Group of Seventy-Seven and China" and include large countries such as China, India and Brazil, the members of the Organization of Petroleum Exporting Countries, the African States and the Small Island Developing States (SIDS).

3.2 Commitments

All Parties, industrialized and developing countries are committed to the fulfilment of their obligations under the UNFCCC based on their national circumstances.

These include the following:

The preparation and regularly updating of national climate change programmes for:-

- Mitigation
- Adaptation
- Measures to address sources of greenhouse gas emissions
- The protection and enhancement of carbon "sinks" and "reservoirs" (forests and other natural systems that remove carbon from the atmosphere).

The taking of climate change considerations into account in their

- Social, economic and environmental policies,
- Use of impact assessments to minimize any adverse economic, health or environmental consequences due to climate change measures.

The promotion of the development, application and transfer of

- Climate-friendly technologies and practices, and
- The sustainable management of carbon sinks.
- Preparations to adapt to climate change,

Participation in

- Climate research,
- Systematic observation and information exchange, and
- The promotion of education, training and public awareness relating to climate change.
- The compilation of an inventory of their greenhouse gas emissions, and the submission of these reports known as "national communications" on the actions they are taking to implement the Convention.

Article 4 of the Convention stipulated these commitments and the relevant text of this Article is included in **Appendix II**.

3.3 Jamaica's Programme of Implementation

3.3.1 Focal Point Institution

The Meteorological Service is recognized as the Focal Point Institution for Jamaica for climate change and climate change related issues. This is based on the provisions that were made for the establishment and maintenance of a network of national focal points for the Convention. Parties not included in Annex I was invited by the Subsidiary Body for Implementation (SBI) to nominate national focal points for the facilitation of the preparation of national communications[7].

Furthermore, the Subsidiary Body for Scientific and Technological Advice (SBSTA), at its second session, "invited Parties to identify the relevant governmental authority/ministry authorized to accept, approve or endorse activities implemented jointly and to report them to the Conference of the Parties (COP) through the UNFCCC secretariat"

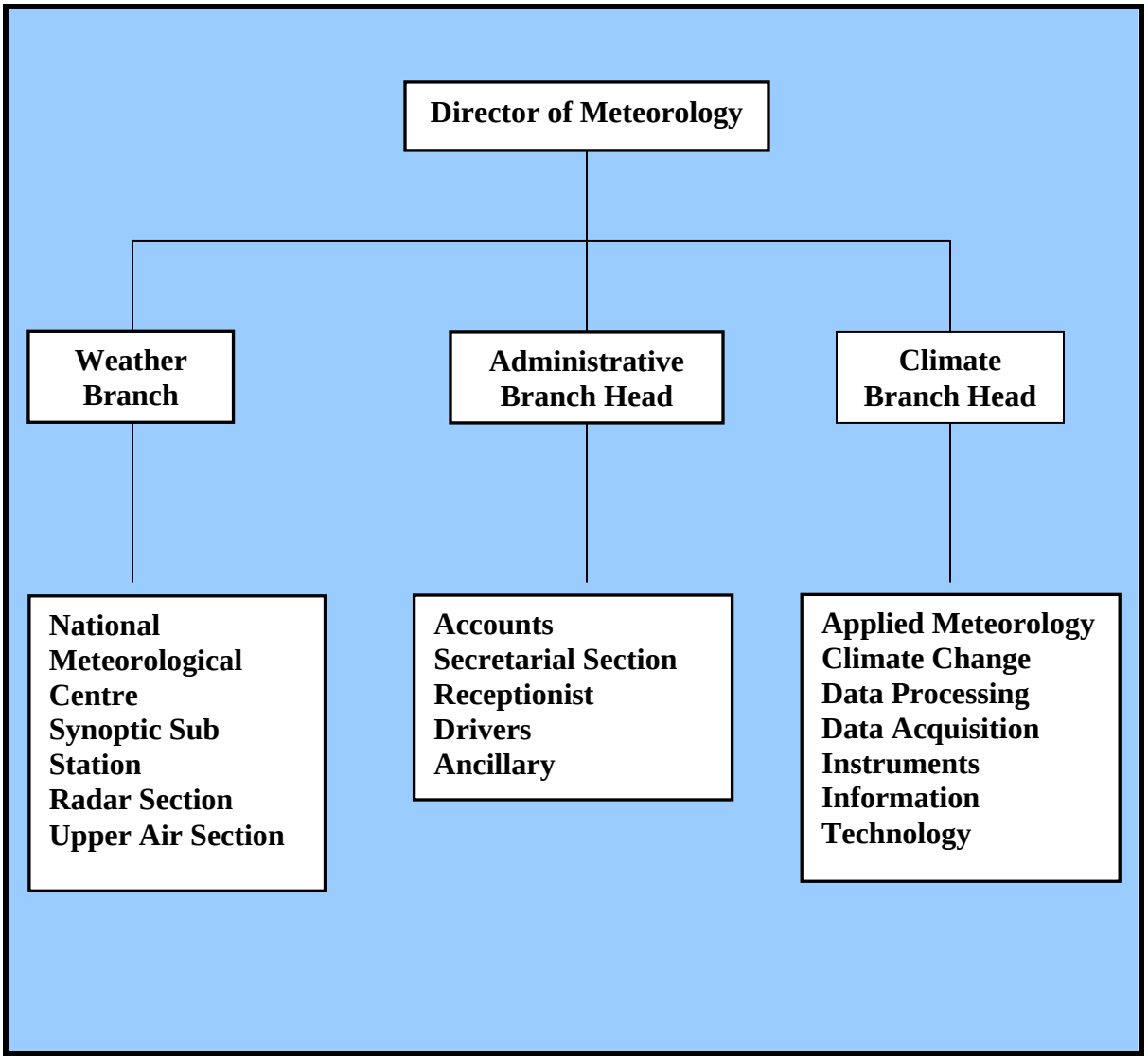
The Meteorological Service is the focal institution for climate change and climate change related activities in Jamaica and has been involved in the mainstream of Climate Change activities longer than any other Jamaican institutions. This was first accomplished by the role of the Directors of the Service in their role as Jamaica's Permanent Representative to the World Meteorological Organization, the international organization responsible for bringing the issue to the world's attention

The Service has provided the Project Coordinator for the project "Preparation of the Jamaica's Initial National Communication to the UNFCCC" and the National Coordinator for the preparation of Jamaica's National Issues Paper for Integrated Adaptation Planning and Management. Additionally, other representatives of the Meteorological Service have been national focal points for several regional climate change initiatives including:

- National Consultations for the preparation of the project proposal for the regional project: Caribbean Planning for Adaptation to Global Climate Change (CPACC).
- National Implementing and Coordinating Units for the projects
  - Caribbean Planning for Adaptation to Global Climate Change
  - Adapting to Global Climate Change in the Caribbean
  - Mainstreaming for Adaptation to Climate Change

[7] FCCC/CP/1996/6/Add.2, 4 July 1996

Box 1. Organisational Chart Meteorological Services



The Climate Branch is responsible for maintaining a current database of the climate of Jamaica and utilises this data to provide climatic information to the productive and other sectors of the country. The main sections of the Climate Branch are

- Data Acquisition Section that establishes and maintains an island-wide network of rainfall and climatological stations;
- Data Processing Section that gathers, archives and analyses the climatological data with a view to monitoring and assessing the climate of the island; and
- Applied Meteorology Section that processes the specific needs of clients mainly for hydro-meteorological and agro-meteorological concerns. These include crop water requirements, design criteria for hydrologists and engineers, and climatological reports on severe weather events for weather related legal and insurance settlement issues

Climate Change issues are the responsibility of the Director of Meteorology. However these duties have been delegated to the Head of the Climate Branch who is the National Focal Point of Jamaica to the UNFCCC.

Mr. Jeffery Spooner Head of the Climate Branch is the National Focal Point and was nominated to this post by the Ministry of Land and Environment. . He is included in the list on the official website of the UNFCCC (www.unfccc.int) as the Focal Point of Jamaica to the UNFCCC.

The Focal Point is the main negotiator for the climate change issues for Jamaica. These negotiations are facilitated through the sessions of the Subsidiary Body for Implementation and the Subsidiary Body for Scientific and Technical Advise and the annual Conference of the Parties of the UNFCCC. Nationally, the FP is responsible for coordinating the implementation of Climate Change enabling activities in particular the preparation of national communications. Other roles of the National Focal Point include :

- National representative to the sessions of the Subsidiary Bodies (SBSTA, SBI)
- National representative to the Conference of the Parties to the Convention.
- Bureau Member of COP 9 representing the Group of Latin America and the Caribbean (GRULAC).
- Chair Group of Latin America and the Caribbean (COP 9)
- Coordinator for Contact Group on The Implementation of Articles 4.8 and 4.9 of the Convention (Buenos Aires Program of Action, 1998) for Alliance of Small Island States (AOSIS);
- Representative of Group 77/China for special meetings with the United States of America (COP 6 II) representing AOSIS;
- Regional Coordinator for CDM activities in the Caribbean (2004)
- National Representative to sessions and plenary of the Intergovernmental Panel On Climate Change

At the national level the Meteorological Service's role includes:

- Focal Point National Consultations Report for Project Proposal: Caribbean Planning for Adaptation to Global Climate Change
- Focal Point and chair of the National Implementing and Coordinating Unit for the regional projects:
    - Caribbean Planning for Adaptation to Global Climate Change
    - Adapting to Global Climate Change in the Caribbean
    - Mainstreaming for Adaptation to Climate Change
- Project Coordinator Preparation of the Jamaica's Initial National Communication to the UNFCCC
- National Coordinator for the Preparation of Jamaica National Issues Paper for Integrated Adaptation Planning and Management for Climate Change

There are members of other organisations who play a role in the country's climate change programme and these are described in **Appendix III**.

3.3.2 Establishment of a National Climate Change Committee

A National Climate Change Committee (NCCC) was never established one of the requirements for the initial national communication. There are several reasons for this including having the committee as part of the Sustainable Development Council of Jamaica. Several l attempts have been made for the establishment of the Council but to date they have all been unsuccessful.

There were suggestions for the Project Steering Committee for the National Communication to function as the National Climate Change Committee after the submission of the initial national communication. The drawback would be that a NCCC should have a broader representation with a high-ranking chair unlike the Project Steering Committee. There has been no Project Steering Committee for the past three years.

Presently, the Project Steering Committee has been revived primarily functioning as a National Coordinating and Implementing Committee for the implementation of the MACC and JCCEA projects.

Table 1contains an analysis of stakeholders who have been involved in climate change activities to date including the preparation of Jamaica's Initial communication to the UNFCC. These stakeholders could potentially be considered for membership to the National Committee which is intended to direct Jamaica's Climate Change Programme.

TABLE 1: MATRIX FOR STAKEHOLDERS ANALYSIS

Institutions	**Representatives**	**Reason For Inclusion**	**Possible Role**
National Meteorological Service	Mrs. S. McGill (Chair) Director	Agency responsible for international negotiations, climate information and climate science	Head Focal Point Institution Climate Change Unit
National Meteorological Service	Mr. J. Spooner Climate Branch Head	National Focal Point UNFCCC	Focal Point Negotiations Climate monitoring, National Communications
Ministry of Water	No representative named	Responsible for	Water Resources and Use

& Housing		National water resources and usage.	Policy formulation and implementation
Ministry of Land & Environment	Ms. L. Barnaby Senior Director, Mrs. A. Calnick Mr. P. Brown Senior Director	GEF Focal Point. Ministry with responsible for the effective management and administration of land and the sustainable planning and development of the island's built and natural environment.	Environmental Policy formulation and implementation Climate Change Unit CDM Designated National Authority
Ministry of Agriculture	Mr. B. Evans Data Evaluation Unit	Ministry responsible for agricultural policy, development of agricultural sector, production and marketing of agricultural products, agricultural research and agro-industrial development.	Policy decisions on Food Security including research in new more resilient varieties, maintaining a database of agricultural crop production
National Environment & Planning Agency	Mr. P. Wilson-Kelly Ms. B. Elvey	Agency responsible for natural resources conservation, town and country planning, land development and utilization, beach control, watershed and wildlife protection	Policy decisions for integrated coastal zone management including use of coastal zone, monitoring and protection of coral reef
Ministry of Foreign Affairs & Foreign Trade	Mrs. N. Taylor-Roberts	Responsible for ensuring Jamaica's compliance with its obligations under bilateral, regional and international agreements	Provide Diplomatic support for negotiations
Planning Institute of Jamaica	Ms. C. Selvyn Mr. H. Peterson	Agency mandated to provide the Government with research and data information for the	Economic and Regulatory Proposals for Adaptation to Climate Change Economic Valuation of Coastal and Marine Resources

		development process.	
Forestry Department	Mr. K Porter	Agency responsible for the management and conservation of Jamaica's forests	Lead for the enhancements of forests
Government Survey Department	Ms. C. Edwards	Agency responsible for tidal measurements	Sea level monitoring
Water Resources Authority	Mrs. N. Ferguson Mr. A. Haiduk	Agency with responsibility for the management, protection, and controlled allocation of the island's surface and underground water resources including its uses	Lead for vulnerability assessments and adaptation options for the water sector
Office of Disaster Preparedness & Emergency Management	Dr. B. Carby	Agency responsible for implementing pro-active and timely measures to prevent or reduce the impact of hazards on Jamaica, its people, natural resources and economy	Coastal vulnerability and Risk assessments
University of the West Indies Centre for Marine Studies	Dr. G. Warner	Unit with the responsibility for research and graduate training in the marine sciences including coral reefs.	Marine research and coral reef monitoring
University of the West Indies Physics & Applied Sciences	Dr. A. Amarakoon	Group involved in climate studies, climate research and numerical weather predictions.	Numerical weather predictions, climate sciences
University of the West Indies Chemistry Department	Dr. W. Pinnock	Department involved in studies and research in manufacturing processes.	National GHG inventory of industrial processes

Energy Division PCJ	Mr. C. Watson	Division responsible for energy policy	Formulation of Mitigation Policy and development of alternate energy sources

3.4 Review of National Activities

All Parties to the Convention accept commitments that are articulated in Article 4 and generally include[8]:

- The development and submission of National Communications which should contain information such as inventories of sources and removal by sinks of Greenhouse gases not controlled by the Montreal Protocol.
- The adoption of National Programmes to mitigate Climate Change and to develop strategies to enable each country to adapt to the impacts that climate change may cause.
- Promote the transfer of environmentally sound and climate friendly technologies and the sustainable management of resources.
- The addition of climate change considerations to socio-economic and environmental policies.

Jamaica has implemented climate changing activities at the regional and national levels and a timeline of these events is presented in Table 2.

TABLE 2 : TIMELINE OF EVENTS (1992-2004)	
1992	Signatory to the UNFCCC
1994	➢ DSM Program ➢ Jamaica's Energy Efficiency Building Code installed as Code of Practice
1995	Became a Party to the UNFCCC
1997	Signatory to the Kyoto Protocol
1998	Photovoltaic system established

[8] From Brief For Signing Of Climate Change Convention Project For Hon. Minister Blythe the Minister of Water & Housing April 1998.

1999	Accessed to Kyoto Protocol
2000	➢ First national communication submitted ➢ CPACC ends
2004	➢ ACCC ends ➢ MACC commences ➢ Climate change Enabling activities expedited funding in Priority Areas implemented

Perhaps the most significant of these activities in respect of the country meeting UNFCCC requirements was the preparation of the initial National Communication in 2000. The details of that activity are described in **Appendix IV.** Additionally a number of activities which had some relevance to climate change were undertaken although not in any coordinated fashion (**Appendix V**).

3.5 Regional Activities

Jamaica has benefited from several regional climate projects that have been implemented by the Regional Project Implementing Unit that has been transformed into the Caribbean Climate Change Centre. These include

- Caribbean Planning For Adaptation to Climate Change (CPACC)
- Adapting to Climate Change in The Caribbean (ACCC)
- Mainstreaming Adaptation to Climate Change (MACC) and
- National Communication Support Program (NCSP)

The projects implemented in the fourteen Caribbean states that are Parties to the Convention and members of the Caribbean Community have provided both institutional and human capacity building. These include the provision of computer equipment to the NMS and NEPA as well as training in several areas including Internet usage, vulnerability assessments, and metadata utilization at the national level. However the weakness of regional activities is that only a few persons can participate. These numbers are not sufficient to fully meet Jamaica's capacity needs to fully implement its obligations.

3.6 New Projects

3.6.1 Expedited Financing for Capacity Building in Priority Areas (JCCEA Phase II)

The expedited financing for capacity building provides additional interim funds of US $100,000 for maintaining and enhancing the capacity to prepare future National Communications. The project is being implemented by the Meteorological Service and commenced in August 2004. The project duration is twelve months and the main activities are:

- Identification and submission of technology needs
- Capacity building to assess technology needs, modalities to acquire and absorb them, design, evaluate and host projects
- Capacity building for participation in systematic observation networks

- Preparation of programmes to address climate change

3.6.2 Second National Communication

The Global Environment Facility has prepared operational procedures for the expedited financing of national communications from non-Annex I Parties to assist eligible countries to formulate and submit proposals based on COP 8 guidelines. Under these operational procedures up to US $405,000 is made available to each non-Annex I Party for the preparation of its national communication. The GEF also provides an additional US $15,000 per country for stocktaking exercise and stakeholder consultations in preparation of the project proposals

New guidelines for the preparation of national communication were adopted by COP8 in New Delhi and will be used for the preparation of Jamaica's second national communication. Financial and technical assistance is provided by the climate change secretariat to non-Annex I Parties in preparing their national communications. Parties are invited to submit views on any difficulties that they may experience in dealing with the GEF and its implementing agencies (in Jamaica's case the UNDP). This information will be compiled by the secretariat and reported to the SBI for possible action by the COP.

3.7 Status of Implementation of Activities (To December 2004)

Table 3 outlines the obligations for the Non Party Annex I Parties (includes) Jamaica under the Convention. The table presents two levels of information. Firstly, the statues of negotiation on some aspects of the commitment up to the Cop 9 meeting and secondly Jamaica's "score card" with respect to meeting these commitment on which there is agreement at the level of the Conference of the Parties.

TABLE 3: STATUS OF IMPLEMENTATION OF OBLIGATIONS UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

ACTIVITIES	STATUS
National climate change mitigation programmes	No program developed. However, several energy conservation and energy efficiency programs have been implemented including the DSM activities. Mitigation assessments for 1994 were completed under national communication initiatives.
National climate change adaptation programmes	National vulnerability and adaptation statements are included in national communication, program needs to de developed.
Taking climate change considerations into account in other relevant social, economic and environmental policies	No action at national level.
Guidance to the financial mechanism of the Convention (GEF)	Ongoing agenda item at the negotiating process
Promotion of the development, application and transfer of climate-friendly technologies and practices	Decision expected at COP10 (December 2004)

Preparations to adapt to climate change	No action at national level.
Participation in climate research	No action at national level except CSGM (Mona)
Participation in systematic observation	No action at national level
Participation in information exchange	No action at national level
Education, training and public awareness, public participation and public access to information and international cooperation.	Some aspects still been negotiated. Limited public awareness undertaken.
Compilation of an inventory of their greenhouse gas emissions	1994 Inventory completed and submitted in Nov 2000
Submission of First National Communication	November 2000 (COP6)
Capacity building Initiatives	No action at national level
Implementation of Article 4.8 and 4.9 of the Convention (decision 3/CP.3 Articles 2.3 and 3.14 of the Kyoto Protocol): Adverse effects of climate change and impact of the implementation of response measures	Decision expected at COP 10 (DEC 2004)
Activities implemented jointly under the pilot phase (AIJ)	PHASED OUT
Emissions resulting from fuel used for international transportation: Shipping and aviation "bunker fuels"	Still being negotiated
Co-operation with relevant international organizations	Still being negotiated
Proposal to amend the lists in Annex I and II of the Convention	Still being negotiated
Second review of adequacy of Article 4.2 (a) and (b) of the Convention	On going agenda item
Scientific and methodological assessment of contributions to climate change: the Brazilian proposal	Still being negotiated
Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system: issues relating to hydro fluorocarbons and per fluorocarbons	Still being negotiated
Methods and tools to assess climate change impacts and adaptation options	Still being negotiated

3.8 Status of Implementation of the Kyoto Protocol

The Kyoto Protocol commitments are for Annex I Parties. However, all Parties participate in the negotiations. Article 12 of the Protocol outlines the obligations of Non-Annex I (developing country) Parties in the Clean Development Mechanism and Table 4 outlines some of the main issues of concern for Jamaica that are being negotiated.

TABLE 4: KEY ISSUES UNDER THE KYOTO PROTOCOL

ACTIVITIES	PROPOSED LEAD AGENCY
Land-use, land-use change and forestry (LULUCF)	MOA and FORESTRY DEPARTMENT
Compliance to the Protocol	AG DEPARTMENT
Matters relating to Article 3.14 of the Kyoto Protocol: minimization of adverse social, environmental and economic impacts on developing country Parties in the	FOCAL POINT (NEGOTIATIONS)

implementation of Annex I commitments and matters relating to 2.3 "minimization of impacts of policies and measures of Annex I Parties"	
Guidelines under Articles 5, 7 and 8: Methodological issues, reporting and review	FOCAL POINT (NEGOTIATIONS)
"Good practices" in policies and measures among Annex I Parties	FOCAL POINT (NEGOTIATIONS)
Impact of single projects on emissions in the commitment period	FOCAL POINT (NEGOTIATIONS)
Arrangements for the first session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol	FOCAL POINT (NEGOTIATIONS)

3.9 SUMMARY

In general Jamaica since it signed the Convention thirteen years ago not achieved as much as could have been reasonably expected within the given time frame. The main reason for this may be the lack of sustained focus on climate change activities perhaps due in part to the absence of the Climate Change Committee to guide and focus the country's programmes. Other reasons could be the relatively low level of public awareness with respect to the implications of climatic change to the national development along with the absence of full political buy-in in light of other pressuring social issues which are often the main focus of government actions. The following chapter of the report will seek to examine and evaluate the enabling/supporting framework which is in place to support the Climate Change Programme in light of natural priorities and its obligations to the UNFCCC.

4 CAPACITY BUILDING ISSUES FOR CLIMATE CHANGE

The UNFCCC recognised that the implementation of the Convention would pose challenges to many countries and in an initial needs assessment identified the following areas for capacity building for developing countries all of which are relevant to Jamaica.

a) Institutional capacity-building, including the strengthening or establishment, as appropriate, of national climate change secretariats or national focal points;
b) Enhancement and/or creation of an enabling environment;
c) National communications;
d) National climate change programmes;
e) GHG inventories, emissions database management, and systems for collecting, managing and utilizing activity data and emission factors;
f) Vulnerability and adaptation assessment;
g) Capacity-building for implementation of adaptation measures;
h) Assessment for implementation of mitigation options;
i) Research and systematic observation, including meteorological, hydrological and climatological services;
j) Development and transfer of technology;
k) Improved decision making, including assistance for participation in international negotiations;
l) Clean development mechanism;
m) Needs arising out of the implementation of Article 4, paragraphs 8 and 9, of the
n) Convention;
o) Education, training and public awareness;

p) Information and networking, including the establishment of databases.

4.1 Skills Required for Implementation

Climate Change will affect many different sectors of the Jamaican society. In many respect new skill sets will be required as the country seeks to develop programmes which respond to the realities of climate change. Table 5 shows some of the skills that will be required. It must be recognised that some of these skills are available nationally not all reside in the relevant organisations. Nevertheless capacity-building initiatives will be required to tailor these skills to undertake the requirements for the implementation of the Convention. In many cases one individual will possess several of these skills. A list of some of the country's training institution is found in **Appendix VI** while **Appendix VII** outlines some training workshops and seminars which have been focused on climate change.

TABLE 5: MATRIX OF REQUIRED SKILLS		
Skills Required for Responding to Economic Impacts		
Area of Expertise	**Relevant Sector**	**Requirement**
Human/Economic Geographers,	All Sectors	Assessing economic impacts
Resource/Environmental Economists,	All Sectors	Assessing the economic cost to the environment
Environmental Scientist,	All Sectors	Assessing the scientific impact to the environment
Resource Managers,	All Sectors	Managing of resources
Skills Required for Responding to Physical Impact		
Area of Expertise	**Relevant Sector**	**Requirement**
Coastal zone management specialists,	Coastal Zone	Planning physical use of coastal zone by assessing vulnerabilities & adaptation options
Coastal managers	Coastal Zone	Enforcement of adaptation options for physical use
Physical oceanographers	Coastal Zone	Assessing the vulnerability of coastal seabed
Marine/fisheries scientists	Coastal Zone	Vulnerability assessments of marine ecosystems and marine life
Hydrologists,	Water Resources	Monitoring and predicting availability of water resources
Water resource specialists	Water Resources	Developing strategies for use of water resources based on climate change considerations
Hydro-geologists,	Water Resources	Assessment of aquifers vulnerabilities and options to mitigate them
Agro-climatologist,	Agricultural	Provision of long term predictions for crops
Agro-meteorologists	Agricultural	Provision of short term predictions to agricultural sector
Skills Required for Responding to Social Impacts		
Area of Expertise	**Relevant Sector**	**Requirement**

Social scientists,	All sectors	Assessing impacts on society
Population and cultural geographers	All sectors	Impact on population and culture
Social anthropologists,	All sectors	Relating past impacts to future planning
Human security,	All sectors	Planning for response to impacts on human well being
Livelihood specialist,	All sectors	Assessments on impact on well being
Sustainable development specialists	All sectors	Planning for response to impacts

4.2 Summary

There is a significant gap in the skills and experience needed to carry out effective climate change programmes. The country will require a significant investment in training even where basic skills exist to close the gap.

5.0 REVIEW OF POLICIES LEGAL INSTRUMENTS, AND/OR NON-REGULATORY MECHANISMS

5.1 Policy and Legal Frame work

Climate change concerns are not included in any of the relevant legal instruments, policies and/or non-regulatory mechanisms of Jamaica. However, the Senior Director for the Environmental Management Division of the Ministry of Land & Environment believes that "there is a wide range of policies, plans and legislation that need to take climate change into account, ranging from public education and awareness (including environmental stewardship programs) to transport, and development policies and programs. There is particular need for attention in terms of infrastructure development and protection. The policies also need to consider where there are linkages with climate change."

The relevant legal instruments that may need to be amended to include climate change concerns are in Table 6. This list was compiled from the responses to the questionnaires (**Appendix II**) as well as a review of various documents.

TABLE 6: RELEVANT LEGISLATIONS

THAT SHOULD INCLUDE CLIMATE CHANGE CONCERNS

AGENCIES	RELEVANT LEGISLATION
National Environmental Societies Trust	• NRCA • Beach Control • Fisheries Act • Forestry Act
Water Resources Authority	• WRA Act • Management of Resources Regulations • Protection from Pollution Regulations • Flood Water Control Management Regulations
National Environment & Planning Agency	• Town & Country Planning Act • Town & Country Planning Regulations • Natural Resources Conservation Act • Natural Resources Conservation Regulations • NEPA Act (been drafted) • NRCA Act • Beach Control Act • Watershed Act • Wildlife Act • Land Utilization Act

TABLE 6 (CONTINUED): RELEVANT LEGISLATIONS THAT SHOULD INCLUDE CLIMATE CHANGE CONCERNS	
Ministry of Land & Environment/NEPA	• Watershed Act • Watershed Policy • Hazard Mitigation Policy • Legislation controlling importation of Ozone Depleting Substances • National Bio Safety Action Plan • Beach Policy • Policy on Oceans & Coastal Zone Management
Forestry	• Forest Act of 1996 (Update needed) • National Forestry and Conservation Plan (2001) • National Planning Act (needs to be reviewed)
ODPEM	• Disaster Preparedness and Emergency Relief Coordination Act of 1993, • Disaster Preparedness and Emergency Management Act.

The current policy framework does not provide clear direction for the country's response to climate change. Where there are references these are not wholistic or integrated. There is currently only one piece of draft legislation which refers to climate change in every way- that is the air quality regulations being produced by NEPA which refers to green house gases.

5.2 Findings of Policy & Legal Review

In general the findings were:-

- No legal instrument has been reviewed or amended to include climate change considerations.
- Some policies have been amended and now include a section on climate change. However the references are vague and general in nature.
- Climate change is seen as important but specifically how it is to be addressed is not included.
- Policies that now include a section on climate change are the Jamaica National Environment Action Plan Status Report 2002 and the National Forest Management & Conservation Plan (2000).

6. FUNDING OPPORTUNITIES

6.1 Internal

The Meteorological Service must be properly funded and staffed to perform its role as National Focal Point and that of Focal Point Institution. The implementation of some climate change

enabling activities may have suffered when several key staffers were on study leave between 2001 and 2004. However, all that have been that has been required up to this point is the provision of personnel for key roles such as the negotiations, project coordination, coordinating the regional projects and servicing of the tide gauges. The Meteorological Service has no budgetary provision for climate change activities but has absorbed these activities into other budget lines. However these funds are not sufficient for the programme activities. In addition, supporting government organisation have not committed resources to climate change activities in any focused or strategic way.

6.2 Funding Opportunities

A number of Annex II Parties declared in July 2001 that they would collectively contribute US$410 million (€450 million) per year by 2005 with this level to be reviewed in 2008. This funding would include contributions to GEF climate change related activities, bilateral and multilateral funding, funding for SCCF, the Protocol Adaptation Fund, the LDC Fund and funding deriving from the share of proceeds of the CDM following entry into force of the Kyoto Protocol. The GEF included in its report to COP 8 the arrangements for the establishment of these funds.

6.2.1 Global Environment Facility (GEF)

The Global Environment Facility (GEF) is now the main funding channel for climate change projects in developing countries. Since 1991, approximately US$1.6 billion was provided in grants from the GEF Trust Fund to climate change activities. An additional amount of more than US$ 9 billion has been leveraged through co-financing from bilateral agencies, recipient countries and the private sector. Over the most recent reporting period (June 1, 2002-June 30, 2003), total project financing for climate change activities exceeded US$ 1,116 million, of which the GEF provided US$ 183 million in grant financing.

Jamaica has received US $332, 780.00 from the GEF for the following:

- National Communication (US $ 232,780.00) (1998-2000)
- Additional Financing for Capacity Development in Priority Areas (US $100, 000.00) (Aug 2004 – Jul 2005)

6.2.2 Special Climate Change Fund

The SCCF will finance projects relating to capacity building, adaptation; technology transfer; climate change mitigation; and economic diversification. Resources from the fund would be also used to fund adaptation in the areas of water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, and integrated coastal zone management. The fund is in the final stage of negotiations and could become operational in 2005.

6.2.3 Adaptation Fund

The Adaptation Fund is established under the Kyoto Protocol, will support adaptation activities when the Protocol enters into force. The source of these funds will be the share of proceeds acquired by the Clean Development Mechanism.

6.2.4 Clean Development Mechanism (CDM)

The CDM allows Annex I Parties to implement projects that reduce emissions in the territory of a non-Annex I Party. The certified reduction units (CERs) generated by such projects can be used by Annex I Parties to help meet their emissions targets while the projects also help non-Annex I Parties to achieve sustainable development and contribute to the ultimate objective of the Convention. Funds generated from the share of proceeds or by taxation of profits should be used to address climate change activities.

6.2.5 Bilateral Sources

There are several Annex I Parties that support capacity development initiatives in developing countries. Those that have supported initiatives in our region are included in Box 2. The source of this information is the technical paper "The range and effectiveness of capacity-building in developing countries" FCCC/TP/2004/1, 14 June 2004.

Box 2: List of Potential Bilateral Funding Sources

Canada supports among other things capacity-building activities regarding research, technology transfer and renewable energy in Central and Eastern Europe, Africa, Latin America and the Caribbean, and Asia, through its Climate Change Fund and the CDM and JI Office

The countries of the ***European Community*** conduct diverse climate change activities through numerous programmes on capacity-building in multiple countries in the areas of energy, the environment and agriculture, to strengthen technical and institutional capacity at all levels in research and systematic observation, vulnerability and adaptation assessment, the integration of adaptation responses into national development strategies, enabling environments and technology transfer, the CDM, and education and awareness.

***Finland*'s** contributions to capacity--building consist of projects in different parts of the world, focusing mainly on the CDM/JI and forest management.

Germany's Climate Protection Programme in Developing Countries aims to strengthen relevant organizations and institutions in developing countries, as well as enhancing their personnel resources, and to develop such organizations and institutions.

Japan has two main projects – the Kyoto Initiative, and the Environmental Conservation Initiative for Sustainable Development – and two regular courses that provide extended training to developing countries worldwide. The courses are on technology for GHG emission mitigation and capacity building for policy makers regarding global warming (Kyoto Mechanisms).

Norway contributes to capacity--building in different parts of the world by providing assistance for energy efficiency projects, forest conservation and replanting projects, technology transfer projects, and the CDM and JI.

The Netherlands' main programme is the Climate Change Studies Assistance Programme. This programme helps to develop climate programmes in developing countries and to conduct analyses of cost-effective measures.

Switzerland has supported studies of participation in the CDM. It also supports projects on sustainable urban development and transport, such as those in Bolivia and China.

The United Kingdom supports capacity-building through one fund and five main climate change programmes: (1) the Climate Change Challenge Fund; (2) the Technology Partnership Initiative; (3) the Environmental Technology Best Practice Programme; (4) the Knowledge and Research programme; and (5) the Cleaner Technologies to Lower GHG Emissions programme.

The United States supports four main capacity--building in climate change initiatives: the Initiative on Joint Implementation; the Country Studies Programme; the Climate Change Initiative; and the Border Program. These are mostly related to strategic planning, policy research and outreach on GHG reductions for transport, supporting environmental technology centres, and the transfer of technology and know-how. This assistance benefits many developing countries, including Brazil, China, India, Indonesia and Mexico.

6.2 Summary

There is not significant budgetary support for climate change programmes in Jamaica. However, it must be noted that the country has not fully articulated its climate change programme. The absence of clarity has perhaps resulted in missed opportunities to access funds to assist the country in its programmes. While admittedly there is significant competition for climate change funding- the funds that the country has received to date suggest that we have not fully exploited these funding mechanisms. As the country moves forward with its programmes in climate change this is one of the gaps which must be closed. Jamaica must address the capacity issues which have prevented it from fully grasping the opportunities for external funding. These issues relate to not only to institutional capacity concerns but the matter of national priorities and leadership.

7.0 FINDINGS AND RECOMMENDATIONS

7.1 Findings

Jamaica has achieved some things over the last thirteen year but is still in need of integrated coordinated, directed and sustained programmes to appropriately address climate change issues. The following are the findings of this assessment.

- The Meteorological Service has never operated as the institution with sufficient authority with respect to the implementation of the convention. This function has been shared at various times between the GEF Focal Point, the Ministry of Foreign Affairs and Foreign Trade and whoever is the parent Ministry of the Meteorological Service (MS)[9].

  An example is the nomination of persons to attend meetings of the Convention Bodies. There is no written procedure as to how that person or person(s) is selected and which organization the MS or other wise that has the vested responsibility for making the final nomination. This situation was exacerbated by the movement of the MS from the Ministry of Water and Housing in 2001 to the Ministry of Transport and Works to the Ministry of Land and Environment.

  The other example of the blurred chain of command is the implementation of the national communication process. There is no clear instruction or procedure for the formulation of this process. Who for example is responsible for implementing the preparation of the project proposal for the second national communication?

- There is a strong consensus for the development of a national climate model. This would be used for impact model studies whose outputs are needed for national planning.
- A national Climate Change Committee would be able to provide answers to these questions.
- Activities are undertaken in several agencies without any synergy or coordination.
- Institutions are unaware of climate change concerns and the fact that there is a role for them in the implementation of the Convention.
- Some of the human resources that is require is present in the institutions, some skills are lacking. The problem is that these resources are not tailored to fit the needs for implementation of obligations. A quantum leap is required to transform these institutions to achieve the dual purposes of meeting their original requirements and the new ones that the UNFCCC brings. This will require both training and financial incentives as job descriptions are transformed.
- A needs assessment of the human resources needs of each institution is required. Such an assessment is beyond the scope of this study.

In addition to these major findings there are a number of bottle necks which have hindered Jamaica's Climate Change Programme.

- No climate change secretariat established
- No functioning National Climate Change committee
- Movement of Meteorological Service from Ministry to Ministry

[9] Conversation with Focal Point Mr. J Spooner.

- Reduced capacity in the Meteorological Service from time to time due to extended periods of training and no additional personnel enlisted in temporary capacity to alleviate the loss.
- The need for a mass based public awareness campaign. No public awareness/education program has been developed to address climate change. Some initiatives such as brochures produced by the Meteorological Service have been attempted. These are in short supply due to unavailability of funds to produce in meaningful quantities.

7.2 Priority Areas of Action

The following table outlines the issues will form the basis for future implementation efforts. The scale of the issue is either national requiring widespread attention or relating to specific localities.

TABLE 7: ISSUES PRIORITIZATION MATRIX

ISSUES	SCALE OF PROBLEM	LEVEL OF CONCERN	ABILITY TO ADEQUATELY ADDRESS ISSUES	PRIORITY RANKING*
Public Awareness & Public Education	National	High	Low	1
Assessment of Vulnerability of Coastal Zone	Local	High	Low	2
Formulation of Adaptation Measures	Local	High	Low	2
Integration of Climate Change Concerns into National Policy	National	High	Low	3
Assessment of vulnerability of Water Resources	National	High	Low	2
Vulnerability of agricultural sector	National	Medium	Low	4
Vulnerability of health sector	National	Medium	Low	4
Develop National Action Plan	National	High	Low	1
The Clean Development mechanism	National	High	Medium	3
*1 = most severe problems, 2 = next most severe, etc				

The level of concern is high or medium. High concerns require immediate attention while medium is still urgent but not as those ranked as high. The ability to address the issues without external assistance is low due to the competing interests on the national budget.

7.2.1 Capacity Constraints

The issues presented for priority attention are the outcomes of several consultations with some of the relevant stakeholders. Constraints at the individual level pertain to inadequate training and insufficient staff. At the institutional level more with organizational culture in accepting

new initiatives, lack of equipment, inadequate office space in some cases and insufficient provision of funds from the national budget. A the systemic level the constraint is the non-support from the decision makers who in some cases are not adequately informed or themselves constrained by lack of funds.

Table 8 provides an overview of the capacity constraints as it relates to the priority issues which have been identified at the individual, institutional and systemic levels.

TABLE 8: CAPACITY CONSTRAINTS MATRIX

Priority Issues	**Capacity Constraints**		
	Individual	**Institution**	**Systemic**
Public Awareness & Public Education	Staffing level of Meteorological Service need to be expanded to adequately address issue	No climate change unit exists	**DUE TO BUDGETARY CONSTRAINTS NO ADEQUATE FUNDING FOR COMPREHENSIVE CAMPAIGN**
Develop National Action Plan	Temporary loss of key climate change personnel at Meteorological Service to studies	Climate Change activities are additional duties shared with normal functions of Focal Point	Need for a national climate change committee to guide process Need to source funding for process.
Assessment of Vulnerability of Coastal Zone	Training required in vulnerability assessments and adaptation measures	Adequate funding will be required for assessments	Vulnerability assessments not part of education curriculum
Assessment of Vulnerability of Water Resources	Training required in vulnerability assessments and adaptation measures	Adequate funding will be required for assessments	Vulnerability assessments not part of education curriculum
Integration of Climate Change Concerns into National Policy	Low level of understanding by relevant personnel	Low priority given to issue	Low level of priority given to issue
Vulnerability of Health Sector	Training required in vulnerability assessments and adaptation measures	Adequate funding will be required for assessments	Vulnerability assessments not part of education curriculum
Vulnerability of Agricultural Sector	Training required in vulnerability assessments and adaptation measures	Adequate funding will be required for assessments	Vulnerability assessments not part of education curriculum
The Clean Development Mechanism	Training in project design and requirements	Strengthening of DNA	Need for long term financing for unit

7.3 Recommendations

The following recommendations are made to be considered for the future .

A. Institutional

- Establish a climate change secretariat in the Ministry of Land & Environment or the Meteorological Service
- Strengthen Focal Point Institution
- Establish National Climate Change Committee (Chaired by high level person preferably Minister MLE)
- Establish Climate Change Unit/Secretariat/Department
- Integrate climate change consideration in national development policy.
- Private sectors, non- government and community-based organizations must be brought into the process and given meaningful roles to fulfill.
- Institutions will require additional equipment including high-speed computers and other specialized technical equipment. An initial needs assessment will be required of all relevant institutions.
- The legal and policy instruments will require review and amendment by legal persons with some exposure to environmental issues in particular climate change. (Attorney General Department)
- There will also be a need to identify and examine the possibility of developing indigenous insurance schemes to address specific local needs. Persons in insurance field would need to be exposed to climate change impacts and assessments

A proposed institutional arrangement is found in **Appendix VIII**.

B. Training

- The provision of training in the areas of vulnerability and adaptation technologies.
- The training of persons to use and further improve these vulnerability and adaptation tools. (UNFCCC Secretariat to advise on training areas)
- The training and development of storm surge models and maps. (Meteorological Service, NEPA, UWI, and ODPEM should be responsible agencies)
- The scientific training institutions (UWI, UTECH) will require additional technical expertise in climate change and its related fields. This will enable them to provide training as well as research capabilities for Jamaica to tackle a changing climate.
- The need to enhance the technical skills required for the building of coastal protection structures to include climate change concerns. (Roselle in St. Thomas).This knowledge and training must be dissipated to the widest cross-section of relevant institutions and individuals across the island.

C. Public Education

Design and implement a public awareness program targeting audiences at several levels of the society. Target groups should be:

- Policy makers,
- Different age groups,
- Lecturers
- Teachers
- Teacher Trainers
- General public
- Groups in vulnerable areas
- NGOs/CBOs

D. Technical Capability

- Develop national action plans for mitigation and adaptation. (Technical group selected by NCC)
- Establish formal climate change research programme. (Meteorological Service should lead but must include UWI, UWI cannot access funding from the Convention MS can)
- Establish GHG database. (Energy Division MCS&T)
- The development of regional climate models at a small scale of small islands to allow for better analysis and understanding of the climatic processes. The CSGM has started to address this issue through the MACC initiative.
- The development of a climate change model which will facilitate impact assessment models to examine the issues that the major sectors of agriculture, water resources and the coastal zone will be required to minimize or adapt to. These must include fundamental issues such as food security, the effects of saline intrusion and the social and economic impacts that activities in the coastal zone will undergo in the different climate change scenarios.
- The development and updating of hazard maps for floods, land-slippages and other hazards. (Meteorological Service, NEPA, UWI and ODPEM should be responsible).
- Review the design criteria and building codes to include climate change concerns. (NEPA, NWA, Parish Councils, Engineering Society, Master Builders Association, MLE).
- There is a need for the formal collection and archiving of baseline data to inform the specific studies and analysis that will be required for the vulnerability assessments. (MS, NEPA, WRA, MOA, UWI)

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APPENDICES

APPENDIX I QUESTIONNAIRE SURVEY OF IMPLEMENTATION EFFORTS

The following questions were posed to several institutions that have an interest and may have participated in climate change activities in Jamaica.

1. Has your institution participated in any climate change activities?

   Yes go to 2 No go to 2

2. Is there is a role for your organization in preparing Jamaica for the effects of climate change?

   Yes go to 3 No end of interview

3. Do you possess the human capacity in your institution to fulfill this role?

   Yes go to 4 No go to 7

4. What are these skills?
5. How can these skills be further enhanced?
6. What additional or new skills would you want for your institution?
7. What are the skills that your institution would want to acquire?
8. What are the legislations pertaining to your organization that need to include climate change concerns?

REASON FOR QUESTIONNAIRE

The main purpose of this questionnaire is to determine if these institutions possess the human capacity to fulfill Jamaica's obligations with respect to the implementation of the United Nations Framework Convention on Climate Change. Interestingly, several institutions that have participated in some kind of activity have expressed that they do not possess the human capacity that their institution requires to fulfill their role in implementing these obligations.

Therefore, it is evident that the fulfillment of Jamaica's obligation to the UNFCCC thus far has been achieved mainly by persons who have added these new and challenging tasks to their other functions and duties. This to my mind is extremely commendable and is testimony of the dedication and loyalty to country that is an overlooked trademark of a vast majority of the Jamaican workforce, in particular those in the public sector.

TABLE 9: RESPONSES TO QUESTION 1, 2 & 3

INSTITUTIONS	**QUESTION 1** Has your institution participated in any climate change activities? Yes go to 2, No go to 2	**QUESTION 2** Is there is a role for your organization in preparing Jamaica for the effects of climate change? Yes go to 3, No end of interview	**QUESTION 3** Do you possess the human capacity in your institution to fulfill this role? Yes go to 4, No go to 7
ODPEM	Yes	Yes	Yes
FORESTRY	Yes	Yes	No
UWICED	Yes	Yes	Yes
PIOJ	Yes	Yes	Depends on the role required
JCDT	No	No	NA

NEPA - CZMU	Yes	Yes	Yes
WRA	Yes	Yes	Yes/No
MOA/RADA	Yes	Yes, Land Use Change Data	No shortage of staff
JADA	Yes	Yes as a Development Agency	Yes
SURVEY DEPT	Yes	Yes, GPS, CPACC	Yes
UWICMS	Yes	Yes	No
UNDP	Yes	Yes I think so, helping to build Capacity and finding resources	Yes
NEST	Unsure	Yes, NGO Umbrella Organization	No Capacity needs to be built up
MLE	Yes	Yes	No, not at all

TABLE 10: RESPONSE TO QUESTIONS 4 & 5

INSTITUTIONS	**QUESTION 4** What are these skills?	**QUESTION 5** How can these skills be further enhanced?
ODPEM	Research, Planning Preparedness, Response	Hazard mapping information needed More manpower On-ground liaison officers
FORESTRY	No response	No response
UWICED	Strategies in climate change monitoring	Spearheading adaptation projects
PIOJ	Monitoring Acquisition	In terms of CC have enough sustainable units and more hands on /monitoring role

	Manager External Cooperation	
JCDT	No response	No response
NEPA – CZMU	Planners Natural Scientists	Dedicated Training in relation to Planning on impacts of sea-level rise, storm intensity and human destabilization
WRA	Monitors Water Quality Technical Experts Consult with Managing Director	Additional staff for Saline intrusion monitoring Coastal aquifers Degradation
MOA- RADA	No response	No response
JADA	Umbrella agency of both rural and urban membership	More training based on available programs
SURVEY DEPT	Surveying	Data Processing Monitoring of Tide Gauges
UWICMS	No response	No response
UNDP	Mostly skills in terms of Project Development Resource Management Mobilization	Not sure. I'd say continued training in working effectively with other agencies in knowing their roles
NEST	No Response	No Response
MLE	NOT APPLICABLE	NOT APPLICABLE

TABLE 11: RESPONSE TO QUESTIONS 6&7		
INSTITUTIONS	QUESTION 6 What additional or new skills would you want for your institution?	QUESTION 7 What are the skills that your institution would want to acquire?
ODPEM	GIS system	No Response
FORESTRY	No Response	Planning Assessors Technical Finance
UWICED	Engineering Environmental Economics Analysts	Technical skills
PIOJ	Human Resources Monitors of Programs	No Response
JCDT	No Response	No Response
NEPA – CZMU	Knowledge in vulnerability of coastal flooding with human settlement	Additional training in GIS Oceanographic training related to modeling in Climate Change
WRA	Refer to Managing Director	Technical Experts Engineers
MOA RADA	No Response	Statistical Analysts Land Valuation experts
JADA	Training	No Response
SURVEY DEPT	None	No Response
UWICMS	No Response	Not a question of skills, more a question of people (manpower).
UNDP	More training in terms of resource mobilization	No Response
NEST	No Response	Research skills in areas of CC Legal & Advocacy skills Management skills
MLE	Skills in the area of vulnerability assessments and development of adaptation strategies. Assessment of projects/project viability. Training with respect to CDM arrangements Expertise to undertake cross sectoral assessments	Technical skills

TABLE 12: RESPONSE TO QUESTION 8	
INSTITUTIONS	**QUESTION 8** What are the legislations pertaining to your organization that need to include climate change concerns?
ODPEM	Act of 1993,
FORESTRY	Forest Act of 1996 (Update needed) National Planning Act (needs review)
UWICED	
PIOJ	Can't think of any directly related to climate change to promote sustainable development
JCDT	
NEPA – CZMU	Town & Country Planning Act including regulations Natural Resources Conservation Act including regulation NEPA Act (being drafted) NRCA Act Beach Control Act Watershed Act Wildlife Act Land Utilization Act
WRA	WRA Act Management of Resources Protection from Pollution Flood Water Control Management
MOA RADA	
JADA	As NGO plays a pivotal role in what is there
SURVEY DEPT	Don't know
UWICMS	Not an expert on regulations. Not sure if there would be any that would be relevant.
UNDP	Not directly relevant to Government directions
NEST	Most Acts NRCA Beach Control Fisheries Act Forestry Act
MLE	Forestry Act (and Conservation Plan Watershed Act (and Policy) Hazard Mitigation Policy Legislation controlling importation of ODS NBSAP Beach Policy Policy on Oceans & Coastal Zone Management See below for additional notes*

TABLE 13: PARTICIPANTS OF SURVEY	
Ms. L. Barnaby Mrs. A. Calnick	Ministry of Land & Environment
Mr. J. Spooner Mr. D. Rankine	Meteorological Service
Ms. K. Aikens	Office of Disaster Preparedness & Emergency Management
Ms. C. Edwards	Survey Department
Mrs. M. Watts Mrs. N. Ferguson	Water Resources Authority
Ms. S. Norton Mr. H. Peterson	Planning Institute of Jamaica
Mr. K. Desai Mr. C. Thomson Mr. A. Henry	National Environment Planning Agency
Dr. G. Warner	University of the West Indies Centre For Marine Sciences
Mrs. S. Outokon	Jamaica Conservation & Development Trust
Dr. C. Douglas Mrs. M. Creary	University of the West Indies Centre For Environment & Development
Dr. D. Smith	United Nations Development Programme
Mr. D. Blake	National Environmental Societies Trust
Ms. G. Ford	Ministry of Agriculture – Rural Agricultural Development Agency
Mr. K. Porter	Forestry Department
Mr. L Brown Mr. J. McClarty	University of the West Indies Climate Studies Group

APPENDIX II SELECTED SECTION OF ARTICLE 4 OF THE UNFCCC CONVENTION (COMMITMENTS)

Article 4 of the Convention of the UNFCCC presents the commitments of all Parties and the relevant sections of the obligations that Jamaica a non-Annex I Party must fulfill are contained in paragraphs one, seven, eight, nine and ten and are as follows:

Paragraph 1

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;
b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;
c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;
d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;
e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;
f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;
g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;
h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;
i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations; and
j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12.

Paragraph 7

The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

Paragraph 8

In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

(a) Small island countries;

(b) Countries with low-lying coastal areas;

(c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;

(d) Countries with areas prone to natural disasters;

(e) Countries with areas liable to drought and desertification;

(f) Countries with areas of high urban atmospheric pollution;

(g) Countries with areas with fragile ecosystems, including mountainous ecosystems;

(h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and

(i) Land-locked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

Paragraph 9

The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

Paragraph 10

The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives.

APPENDIX III RELEVANT INSTITUTIONS

MINISTRY OF FOREIGN AFFAIRS AND FOREIGN TRADE

With the advent of independence, Jamaica attained the status of a sovereign state with the right to take full responsibility not only for national security and defences but also for its relations with the international community and foreign countries. On that basis, Jamaica was able to:

- Negotiate treaties and agreements which protected Jamaica's national interests;
- Set up consular services in foreign countries to protect the interests of Jamaicans overseas;
- Collect and analyse information on political, economic, trade and social developmental issues which had an impact on the island's national goals; and
- Participate in multilateral activities through membership in international and regional organizations.

In order to achieve these objectives, the Ministry of External Affairs was established on the attainment of Independence on 6 August 1962. The name was changed to Ministry of Foreign Affairs in 1976, in an effort to more accurately reflect the portfolio responsibilities of the Ministry. The name was later changed to include the Ministry of Foreign Trade in order to encapsulate the economic responsibilities of the Ministry.

The Ministry is committed to: -

- The promotion of friendship and cooperation through political and diplomatic channels;
- Promoting international peace and security;
- Providing effective representation of the Government of Jamaica overseas through resident diplomatic missions and consular posts;
- Ensuring Jamaica's participation in bilateral, regional and multilateral fora towards the conclusion of mutually beneficial agreements;
- Monitoring and responding appropriately to external political and economic developments that impact on national development goals;Ensuring Jamaica's compliance with its obligations under bilateral, regional and international agreements;Creating opportunities for foreign trade, investment and tourism;Negotiating technical cooperation agreements, which promote Jamaica's development objectives;
- Securing development assistance and debt relief for Jamaica;
- Projecting a positive image of Jamaica overseas and developing international cultural and sporting contacts;Protecting the interests of Jamaican nationals overseas, returning residents and visitors to Jamaica;

The Ministry of Foreign Affairs and Foreign Trade has through its representatives at the Embassy in Germany participated in several meetings of the Subsidiary Bodies and the Conference of The Parties. The Office to the United Nations in New York provides representatives at the meetings of the General Assembly and the Alliance of Small Island States on climate change activities

Locally, the Ministry chairs the Council on Ocean and Coastal Zone Management and houses its Secretariat. This Council's focus on the Ocean and coast would be important to the implementation of the Convention as the coastal zone would be heavily impacted and affected by some of the predicted effects of climate change.

MINISTRY OF LAND AND ENVIRONMENT10

The Ministry of Land and Environment was established in April 2000. Its creation was in keeping with Government's commitment to ensuring the effective management and administration of land and the sustainable planning and development of the island's built and natural environment.

The Ministry's Mission is ***"to achieve the highest level of sustainable environmental and land management practices that support the economic, physical and social well being of all Jamaicans".***

The Ministry has four (4) Divisions:

- Environmental and Emergency Management
- Land Administration and Management
- Policy, Planning, Development Standards and Mining
- Spatial Data Management

The Agencies that fall under the purview of the Ministry are:

- The National Land Agency (NLA)
- The National Environment and Planning Agency (NEPA)
- The Office of Disaster Preparedness and Emergency Management (ODPEM)
- The National Meteorological Service (NMS)
- The Mines and Geology Division
- The Earthquake Unit
- The Real Estate Board
- The Negril/Green Island Area Local Planning Authority

MINISTRY OF WATER AND HOUSING

The Ministry of Water was created specifically to address the perennial problem of the inadequate supplies of water mainly during the dry seasons. The Ministry at its inception consisted of agencies that represented the life cycle of water from a cloud droplet to a product for consumption or agriculture. These included the Meteorological Service, Water Resources Authority, National Water Commission and the National Irrigation Commission. However, the ministry's mandate has been expended with the addition of the portfolio of Housing.

[10] Provided by Mrs. A. Calnick. Environment Management Division MLE

The direct role of the Ministry in climate change enabling activities was through the joint effort in the preparation of the Initial National Communication. This collaborative effort was spearheaded by the Senior Director of the Emergency Management and Weather Services Unit at the Ministry and the Focal Point to the UNFCCC from the Meteorological Services.

MINISTRY OF AGRICULTURE

The agricultural sector is central to Jamaica's economy accounting for approximately 7.3 % of GDP (2003) and employing more than a fifth of the total labour force. The sector currently accounts for almost one fifth of all merchandises exported.

The challenge facing the sector is how to increase efficiency, productivity and competitiveness in order that planned contribution to GDP will be realized. The key threats result from the level of reliance on imports, the use of inappropriate technologies, high cost of capital and inadequate research and development.

The Ministry of Agriculture is seeking to address these and other problems facing the sector through a programme geared at transformation of the sector. This transformation includes the provision of institutional and other support framework for the development of a viable agricultural sector, improvements in the production and marketing of agricultural produce, the adoption of appropriate technologies and promotion of agro-industrial development.

NATIONAL ENVIRONMENT AND PLANNING AGENCY

The National Environment and Planning Agency (NEPA) is an Executive Agency formed by the merger of

- Natural Resources Conservation Authority (NRCA),
- Town Planning Department (TPD) and
- Land Development and Utilization Commission (LDUC).

Under the aegis of the Ministry of Land and the Environment the aim of the merger is to integrate environmental, planning and sustainable development policies and programmes and to improve customer service.

NEPA operates under the following Acts:

- The Natural Resources Conservation Authority Act;
- The Town and Country Planning Act;
- The Land Development and Utilization Act;
- The Beach Control Act;
- The Watershed Protection Act; and
- The Wildlife Protection Act
- The work of NEPA is guided by the following policies and plans:
- Jamaica National Environmental Action Plan (JaNEAP) 1999-2002
- National Physical Plan

- Policy for Jamaica's System of Protected Areas - 1997
- Biodiversity Strategy and Action Plan
- Watershed Management Policy
- Beach Policy for Jamaica
- Environmental Management Systems Policy and Strategy

WATER RESOURCES AUTHORITY

The Water Resources Authority (WRA) is a statutory body of the Government of Jamaica. Formerly known as the Underground Water Authority the Water Resources Authority was established by the Water Resources Act of 1995 and is Jamaica's premiere hydrologic agency.

The responsibilities of the Water Resources Authority include the management, protection, and controlled allocation of the island's surface and underground water resources including its uses. The Water Resources Development Master Plan is the tool that the WRA uses for its long-term development and administration. This provides for economically feasible and environmentally sound decision making on the current and potential use and allocation of our water resources.

The Water Resources Authority achieves its mandate through several activities including:

- Collecting, compiling and analyzing hydrologic data
- Investigating, assessing, planning and allocating water resources
- Environmental monitoring and
- Impact assessment.

The organization has prepared a series of pollution vulnerability maps for the Island highlighting the susceptibility of the aquifers to pollution and also guidelines for the location of solid waste disposal facilities.
The efficient disposal of solid waste on land reduces the emissions of methane a greenhouse gas. Coastal aquifers are threatened from pollution by saline intrusion resulting from accelerated sea level rise.
The units of the WRA consist of:

- General Management,
- Planning and Investigation,
- Resources Monitoring, Environmental Section,
- Computer,
- Finance,
- Administration and Human Development.

The main areas of concern with respect to capacity development for implementing climate change activities are Planning and Investigation, Resources Management Unit and the Environmental Section.

The Planning and Investigation unit is responsible for updating the Water Resources Management Plan, Resources Monitoring for the quantity and quality of surface and ground water systems and the Environment Section for impacts that could affect humans.

FORESTRY DEPARTMENT

The Forestry Department of the Ministry of Agriculture is the lead agency responsible for the management and conservation of Jamaica's forests. Its functions are mandated by the Forest Act, 1996 and are aimed at managing forests on a sustainable basis to maintain and increase the environmental services and economic benefits they provide.

The administrative structure consists of three Regional Offices whose activities are co-ordinated by Forestry Department Head Office, located in Kingston. The Western Region has its office in Montego Bay and encompasses the parishes of Hanover, St. James, St. Elizabeth, Manchester and Trelawny. The Central Region's office is located in Moneague and consists of St. Ann, Clarendon, a portion of St. Catherine and the western-most part of St. Mary. The Eastern Region has its office at the Head Office in Kingston and takes in the parishes of Portland, St. Thomas, St. Andrew, a part of St. Catherine and the greater part of St. Mary.

A Conservator of Forests who reports to the Permanent Secretary of the Ministry of Agriculture heads the Department. The Department has a staff of 157 persons, with 38 assigned to Eastern Region, 28 to Central Region, 33 to Western Region and 49 based at Headquarters. There are a further 11 posts that remain unfilled due to budgetary constraints.

The long-term impact of the work of the Forestry Department is the maintenance of soil and water resources, biological diversity and benefits to society, as measured by reduced rates of deforestation and environmental degradation, and contribution to national income. This is being achieved through a variety of activities, including a biophysical inventory of Jamaica's forest resources, development of local forest management plans, promotion of agro-forestry practices and reforestation programmes on public and private lands, tree nursery development, public education, and training and extension activities.

A National Forest Management and Conservation Plan have been prepared and were adopted by Cabinet in July 2001. The 5-year Forest Plan articulates the direction and goals of forest management in Jamaica and proposes strategies, programmes and activities for sustainable forest management.

OFFICE OF DISASTER PREPAREDNESS AND EMERGENCY MANAGEMENT

The Office of Disaster Preparedness and Emergency Management is committed to taking pro-active and timely measures to prevent or reduce the impact of hazards on Jamaica, its people, natural resources and economy through its trained and professional staff, the use of appropriate technology and collaborative efforts with national, regional and international agencies.

After the June 1979 Floods, which devastated sections of Western Jamaica, the Government of Jamaica recognised the need for the establishment of a permanent disaster management organization. This organization would be responsible for coordination and monitoring the response to hazards as well as educating the nation on all aspects of disaster management.

The Office of Disaster Preparedness and Emergency Relief Coordination (ODIPERC), was established in July 1980. In 1993, the name ODIPERC was changed to the Office of Disaster Preparedness and Emergency Management (ODPEM), a statutory body, under the provisions of Section 15 of the Disaster Preparedness and Emergency Management Act.
The ODPEM operates out of the Ministry of Land and Environment with a Board of Management to overseas its activities.

- Implementation of Community and Vulnerability Reduction Programme in Portland
- Development of National Disaster Management Plan and Policies
- Relocation of vulnerable persons as a mitigation measure
- Coordination of response, assessment and clean-up activities for disasters and major incidents.
- Establishment of a National Zonal Programme of community- based disaster management structures and procedures.
- Completion and maintenance of a National Disaster Catalogue and Hazard Data Base.
- Completion of Damage Assessment Reports for disaster incidents
- Establishment of a National Emergency Operations Centre
- Establishment of a National Shelter Programme
- Establishment of Community Flood Warning Systems.
- Establishment of a National Relief and Procurement Policy.
- The development of websites, including one specifically dedicated to children.

PLANNING INSTITUTE OF JAMAICA
The Planning Institute of Jamaica (PIOJ) was established in 1955 as the Central Planning Unit (CPU) with the mandate to provide the Government with research and data information for the development process. The CPU became the National Planning Agency in 1974, however, the functions, remained the same as that of the CPU

In 1984 the Agency became a statutory body and was placed under the Ministry of Finance when its name was changed to the Planning Institute of Jamaica The PIOJ up until August 1997 operated like a Central Government department. In 1995 the Institute was selected as one of the entities to be modernized under the Public Sector Modernization Programme, (PSMP).

The PSMP aims to empower managers of selected agencies/entities by granting them enhanced autonomy in managerial, financial, personnel and operation management, in return for strict accountability for predetermined performance targets.

The mandate of the PIOJ is to achieve the following:

- Initiating and coordinating the development of plans, programs and policies for the economic, financial social, cultural and physical development of Jamaica
- Undertaking research on national development issues
- Providing technical support to Cabinet
- Undertaking consultant activities for Government entities
- Managing external cooperation agreements and programs
- Interfacing with funding agencies
- Maintaining a national socio-economic library
- The PIOJ's involvement in the implementation of the UNFCCC includes the following activities:
- Monitoring and review of enabling activities to prepare initial national communication.
- Member of Project Steering Committee
- Provision of economic and social information on Jamaica's national circumstances for the initial National Communication

UNIVERSITY OF THE WEST INDIES -CENTRE FOR MARINE SCIENCES

The University of the West Indies (Mona) has a long history of research and graduate training in the marine sciences. The Centre for Marine Sciences (CMS) brings together marine scientists, based in diverse departments, as a multi-disciplinary group, able to work together on the complex environmental and social issues related to the development of coastal and marine resources

Activities related to Coastal Area Management include:

- Ecosystem studies
- Coastline Management
- Pollution Monitoring & Mitigation
- Fisheries, Matriculture
- Research Activities
- Graduate Training
- Undergraduate Training
- Training in underwater photography and diving technology for scientists

UNIVERSITY OF THE WEST INDIES DEPARTMENT OF PHYSICS

The University and the Physics Department was founded in 1948 by Royal Charter to provide higher education in the then British colonies of the Caribbean. The Faculty of Pure and Applied Sciences at Mona include teaching, research and computer laboratories, classrooms, offices, library, prototyping shops, and other back-up facilities for research.
At the old Cable and Wireless station at Stony Hill, the Department has a 22" optical telescope for its Astronomical studies.

The Physics Department has a large local area network running Windows 9x, Windows ME, Windows NT and Solaris. The Department has several PCs, along with two Fujitsu

ICL multiprocessing NT servers and a number of Unix Servers and workstations dedicated to both research and undergraduate programs.

CLIMATE STUDIES GROUP MONA

In 1994 Physicists engaged in climate studies formed the Climate Studies Group, Mona (CSGM). This is not unusual since physics is the main discipline used to understand climatic processes such as the equations of motion, thermodynamics, hydrodynamics, radiation, cloud physics and the equations for atmospheric water. Climate, rather than weather, is the subject of investigation by the group.

Major Areas of Research in fundamental and applied physics are:

- Astronomy & Astrophysics
- Atmospheric & Environmental Physics
- Electronic Research
- GPS Research
- GPS Error Correction System
- UWI Integrated GPS System
- Renewable Energy Studies
- Study of Lightning Strikes
- Theory of Solids

UNIVERSITY OF THE WEST INDIES CENTRE FOR ENVIRONMENT AND DEVELOPMENT

This organization was established in the early 1990's by the University of the West Indies (UWI) in its response to the growing concerns of the global community about the threats to the world environment. UWICED is funded partially by the UWI but earnings are made otherwise to ensure its sustainability from one of its portfolio functions of administering grant and loan funds to approved projects, on behalf of international and regional bilateral agencies.

UNIVERSITY OF THE WEST INDIES DEPARTMENT OF CHEMISTRY

The first lecture at UWI was given in 1948 to a group of thirty-three premedical students enrolled in a first year Chemistry class. From these beginnings has emerged a vibrant Department with an establishment of 23 academic staff, 50+ postgraduate students and with an undergraduate population of 750+ students each year.

The Department offers undergraduate courses leading to Majors and Minors in General, Applied and Food Chemistry. The research interests of the staff originally focussed on Natural Products but have since expanded to include a wide variety of topics such as: Reaction Mechanisms, Transition and Lanthanide Chemistry, Bauxite and Alumina processing, Environmental issues, Theoretical and Computational Chemistry, etc.

APPENDIX IV INITIAL NATIONAL COMMUNICATION

The process for preparing the Initial National Communication was follows.

- Project proposal prepared by Mr. J. O'Brian, GEF consultant
- Funding provided by the financial mechanism of the UNFCCC
- Executing agency – UNDP
- Implementing Agency – Ministry of Water & Housing/Meteorological Service
- Project document signed April 28, 1998 by Honourable Dr. K. Blythe, Minister of Water & Housing and Executive Director, PIOJ
- Project Coordinator – Mr. C. Mahlung, MS
- Project Administrator – Mrs. U. Gordon

TABLE 14: INSTITUTIONS PROVIDING INFORMATION FOR INITIAL NATIONAL COMMUNICATION

INSTITUTIONS	TYPE OF DATA PROVIDED
Meteorological Service	Meteorological
Planning Institute of Jamaica	Demographic, Economic
Statistical Institute of Jamaica	Demographic, Economic
C. Davis & Associates	Emissions, Emissions Factors
Energy Division	Annual Energy Reports
Airport Authority of Jamaica	Domestic & General Aviation
Forestry Department	Land Use/cover
Ministry of Agriculture	Agricultural
Parks and Market Company	Municipal solid waste
Water Resources Authority	Water sector Policy
Source: Initial National Communication, 2000	

Enabling Activities

- GHG Inventory (energy sector)
- GHG Inventory (non-energy sector)
- GHG abatement analysis and strategy

- National Statements on Vulnerability and Adaptation Options for:
  - Agricultural sector
  - Water Resources sector
  - Coastal Zone
  - Human Health

Jamaica initial communication was prepared by the Ministry of Water and Housing in October 1998 by the Meteorological Service in collaboration with the Emergency Management and Weather Services Division. The two-year project was completed in October 2000 and the report submitted to the COP in November 2000 at The Hague by Honourable Seymour Mullings, Deputy Prime Minister. The document was presented to

and accepted by the Cabinet of Jamaica but was never debated in Parliament and so lacks that national critique by the highest authority of the land. However, it remains an exceptionally useful body of information and is one of the premier publications relating to Jamaica and climate change.

The project number is JAM/98/G31 and the total budget was US $232, 780.00 and is divided into four main parts as follows:

- Part I - National Circumstances and Convention Analysis
- Part II - National Inventory of Greenhouse Gases For 1994
- Part III - Vulnerability and Adaptation
- Part IV - National Policy and Actions

The preparation of the national communication was the collaborative effort of several agencies public and private. The executing agency was the United Nations Development Programme and the designated implementing agency the National Meteorological Service in collaboration with the Ministry of Water.

A list of the institutions providing information is contained in Table 2 and a summary of the result in Table 4.

The project was staffed with a full time project Administrator whose responsibilities included the day-to-day management of the project office. The Project Coordinator provided part-time by the Meteorological Service managed the project in collaboration with the Senior Director, Emergency Management and Weather Service, MW&H.

The major activities were subcontracted to consultants and national experts including the following:

- Dr. Carlos Cabrera of the Cuban Institute of Meteorology an expert in the IPCC methodology for GHG inventories.
- C. Davis & Associates a Canadian based company headed by the Jamaican Dr. Claude Davis prepared the greenhouse inventory for the energy sector.
- Dr. Willard Pinnock of the Chemistry Department of the University of the West Indies was responsible for the preparation of the greenhouse gas inventory for the industrial sector.
- Mr. Keats Hall consultant to the Forestry Department prepared the sections of land use change and forestry.
- Mrs. Ianthe Smith completed the section on emission from the solid waste sector.
- Mr. Lenworth Fulton prepared the greenhouse gas emissions from five agricultural sources.
- Mrs. Theresa Manarangi-Trott and Nancy Convard of the South Pacific Environment Program prepared the national statements on vulnerability and adaptation options, and

- Climate scenarios were generated by Mr. Andreas Haiduk of the Water Resources Authority with training and software provided by the National Communication Support Programme of the United Nations Development Programme.

Dr. Carlos Cabrera conducted a technical workshop on the use of the IPCC Revised Guidelines for the Preparation- of Greenhouse Gas Inventories for participants from all of the relevant sectors.

Table 4 presents a summary of the activities undertaken for the initial national communication.

TABLE 15: SUMMARY OF RESULTS FOR INITIAL NATIONAL COMMUNICATION

PROGRAMME SUPPORT OBJECTIVES	INDICATORS	ACHIEVEMENTS
To prepare the First National Communication for the UNFCCC	• Establishment of Project Steering Committee • Preparation of National Inventory of GHG for 1994 • Analysis of potential options to abate the increase in GHG emissions and enhance the sinks • Assessment of potential impacts of climate change in the country and analysis of potential options to adapt to the impacts of climate change • Compilation and Production of National Communication	• Established and disbanded • Completed • Completed • National Statements • Submitted
To develop and implement policies which incorporate climate change implications	• Establishment of National Climate Committee	To be established
Increase awareness and facilitate information exchange on climate change issues	• Establishment of National Website on Climate Change for Jamaica • Establish a Programme of Public Awareness Change for Jamaica	• Website to be re-established • Funding needs to be identified
Source: Annual Project Report For Tri-Partite Review		

The members of the committee are in Table 5 and their duties included the monitoring and evaluation of the project activities. This committee was also used as a National Implementing and Coordinating committee for the national implementation of the regional climate change projects. The members represent the relevant sectors. Although invited participation from the Private Sector and Non-governmental organizations was lacking.

TABLE 16: PROJECT STEERING COMMITTEE	
MEMBERS	**AGENCIES**
Mrs. S. McGill (Chair) Mr. J. Spooner Mr. C. Mahlung	Meteorological Service
Mr. P. Brown	Ministry of Water & Housing
Mrs. N. Taylor-Roberts	Ministry of Foreign Affairs & Foreign Trade
Ms. L. Barnaby Mrs. A. Calnick	Ministry of Land & Environment
Mr. B. Evans	Ministry of Agriculture
Ms. C, Selvyn	Planning Institute of Jamaica
Mr. A. McKenzie Mr. P. Wilson-Kelly Mr. B. Blue	Natural Resources Conservation Authority/NEPA
Mr. K Porter	Forestry Department
Ms. B. Elvey	Town Planning Department
Mr. N. Francis Ms. C. Edwards	Government Survey Department
Mrs. N. Ferguson Mr. A. Haiduk	Water Resources Authority
Mr. C. Bailey	Office of Disaster Preparedness & Emergency Management
Dr. G. Warner Dr. A. Amarakoon Dr. W. Pinnock	University of the West Indies Centre for Marine Studies Physics & Applied Sciences Chemistry Department
Source: Initial National Communication	

APPENDIXV NATIONAL ACTIVITIES IMPLEMENTED OUTSIDE THE FRAMEWORK OF UNFCCC

There are a number of mitigation activities that were implemented outside the UNFCCC and include: -

- Mitigation Activities In The Energy Sector
- Energy Use And Conservation in The Transport Sector
- Cogeneration
- Other Energy Conservation Measures
- Private Energy Auditing and Subsequent Retrofitting
- Initiatives in the Bauxite And Alumina Sector
- Energy Conservation By The Public Sector
- Hosting discussion programmes in educational institutions and communities
- Advertisement in the mass media
- Distribution of leaflets and pamphlets expounding energy saving tips, and
- Updating and distribution of an energy management handbook.
- Demand Side Management Program which was established in 1994, a number of GOJ properties, which fall under GOJ ministries and agencies, have been subjected to energy audits with the intention of effecting retrofits to realize savings. Some of the properties audited, such as the Ministry of Finance have started to install retrofits, however, the lack of funds have limited overall success.
- Solar Water Heater Testing
- The Energy Efficiency Building Code
- Hydro Power - Jamaica has used hydropower technology for nearly 100 years and has several small hydro plants supplying about 24 megawatts of electricity in current operation. It is the general opinion that the construction of medium or large sized plants in unfeasible due to two main reasons the first is the large volumes of running water that they would require and secondly is the inability to secure the finances for their construction.
- Solar Energy - Jamaica receives an average of 177 MJ/M2 /yr of direct solar radiation. This is enough to supply 5-10 times our annual requirements. The major methods of harnessing this energy that are currently being practiced in Jamaica; are conversion to electricity through the use of photovoltaic cells, solar water heating and solar crop drying
- Photovoltaic Initiatives
- Solar Water Heating - It is estimated that more than 5000 solar water heater units are now installed in Jamaica
- Solar Energy Studies
- Solar Drying
- Wind Energy- The first wind turbine was established in 1996 from both public and private investments and situated at Munro College in St. Elizabeth. The 225 KW turbines continue to supply electricity to the JPSCo grid. The Petroleum Corporation of Jamaica, through its wholly owned subsidiary Wigton Wind farm Limited and started operation in July 2004, constructed Wigton Wind Farm - The

Wigton wind farm. The farm produces and sells over 20 megawatt of electricity to the national grid of the Jamaica Public Service Company.

- Wind Energy Studies -The first was sponsored by the United States Agency for International Development and was conducted by Dr. Anthony Chen of the Physics Department of the University of the West Indies. The second was done by US Wind Power Incorporated a subsidiary of Kennetech Corporation of the United States of America in collaboration with a Jamaican company in the first half of the nineties. A third assessment was conducted in the late nineteen nineties by the Petroleum Corporation of Jamaica and Renewable Energy Systems Limited of the United Kingdom by the inspection of wind disturbed vegetation.
- Biomass
- Fuel Wood
- Solid Waste - The use of solid waste to generate electricity has been stymied by the high investment costs and the low returns.
- The Integrated Waste Management Project
- Ocean Technology (OTEC) Energy -In 1993, the Rockefeller Foundation provided Jamaica with US$95,000 to undertake planning work towards the development of a 2MW open-cycle project. A 10 MW OTEC plant producing 3 million gallons of water per day is being planned for Jamaica.
- Geothermal Energy - The Blue Mountains is the only area in Jamaica in which there is a potential for geothermal power production.

APPENDIX VI NATIONAL TRAINING INSTITUTIONS

University of Technology

There has been a pervasive problem of inadequate human capacity in energy matters throughout Latin America and the Caribbean for a long time as compared with other regions of the world. The CAST Energy Centre that was subsequently changed to the UTech Energy Centre in the mid 1990s was a leading training institution in all aspects of energy after it was assisted significantly under the USAID/GOJ energy conservation/renewable energy project in the mid 1980s. Failure to continue to attract financing has however, almost totally disabled the Centre.

The University of the West Indies (UWI)

The St. Augustine campus of the University of the West Indies has the responsibility for energy conservation and renewable energy technology studies at the tertiary within its engineering faculty located in Trinidad and Tobago.

The faculty of Pure and Applied Sciences at Mona has taken the initiative to lead the other faculties and sub-agencies of the University in not only recognizing the need for energy conservation but also to implement its own measures to achieve energy efficiency in the operations of some of its equipment and lighting systems.

The latest proposal from the faculty of Pure and Applied Sciences is the implementation of a new postgraduate course in Energy Efficiency and Renewable Energy Technologies in the academic year 2000 - 2001.

University Centre for Environmental Development (UWICED)

The University of the West Indies Centre for environment and development devises projects, acquires funds from external sources and undertakes them with its own human resources.

Although the Centre's main focus is environmental and its closest associates are organizations pursuing activities directly concerned with sustainable development through environmental mitigation, its focus on national energy matters was always inevitable.

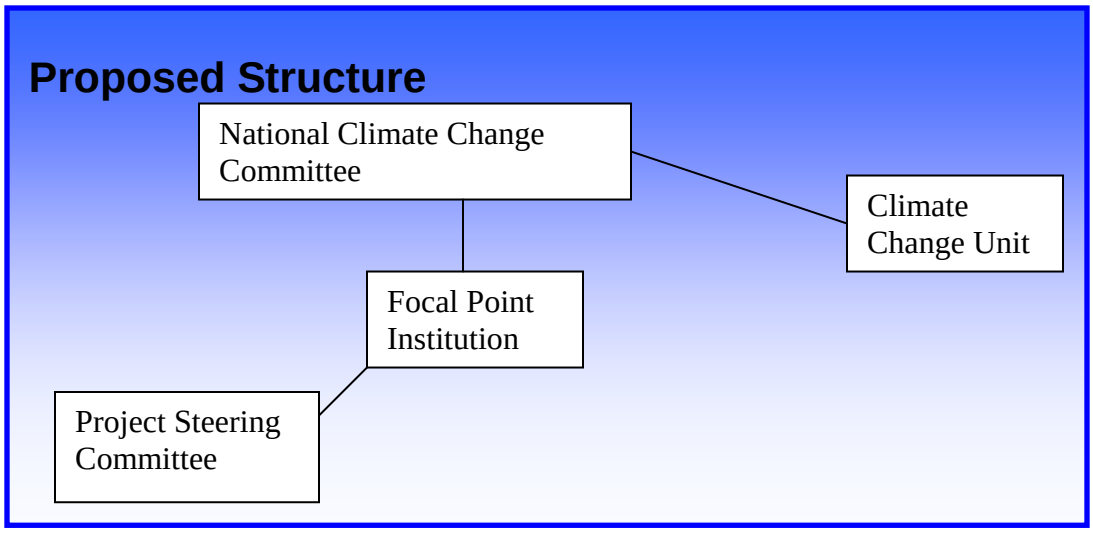
This is because the whole question of climate change, which poses so many challenges to world environment, is all related to the use of energy. In fact, environmental organizations such as UWICED are now resigned to assisting in ensuring that conventional energy sources are phased out as much as possible in the future, in order to arrest the rapid build-up of greenhouse gases.

APPENDIX VII WORKSHOPS, SEMINARS & TRAINING INITIATIVES

The following initiatives were undertaken in preparing the initial national communication.

- Project Initiation Workshop – November 1998, Le Meridian Jamaica Pegasus Hotel, Kingston
- GHG Inventory Workshop – November 1999, Crown Plaza Hotel, Kingston
- Vulnerability Assessment & Adaptation Workshop – April 2000, Courtleigh hotel, Kingston
- GHG Inventory Review – May 2000, Le Meridian Jamaica Pegasus Hotel, Kingston
- GHG Abatement Analysis Workshop – August 2000, Jamaica Conference Centre, Kingston
- National Strategy Workshops – August 2000, Jamaica Conference Centre, Kingston & Holiday Inn, Montego Bay

APPENDIX VIII PROPOSED STRUCTURE



The roles of the units included above are outlined below.

National Climate Change Committee

- Policy decisions
- Strategic Planning
- Broad based with relevant and non-relevant stakeholders (15-20).
- Relevant stakeholders are agencies that will be impacted directly, non-relevant impact would be as a result of direct impact (e.g. Health indirect impact).
- Chaired by the Minister of Land & Environment and
- Meets twice yearly

Climate Change Unit

- Secretariat to National Climate Change Committee.
- Public awareness campaign
- Clearing house for information exchange (receives and disseminate information)
- Coordination with all relevant institutions in particular FPI

Focal Point Institution

- Responsible for the negotiations (UNFCCC, IPCC, others)
- Responsible for preparing and updating national communications
- Chairs Project Steering Committee

Project Steering Committee

- Relevant stakeholders
- Responsibility for developing, implementing national and regional projects evaluation and monitoring of projects
- Consists of several technical sub-groups
- Evaluation and monitoring of projects

- Meets quarterly