Climate Investment Funds

PPCR/SC.10/4
April 16, 2012

Meeting of the PPCR Sub-Committee
Washington, D.C.
April 30, 2012

Agenda Item 5

STRATEGIC PROGRAM FOR CLIMATE RESILIENCE FOR DOMINICA

Proposed Decision by PPCR Sub-Committee

The Sub-Committee reviewed document PPCR/SC.10/4, *Strategic Program for Climate Resilience for Dominica*, a country participating in the Caribbean Regional Program, and

a) endorses the SPCR as a basis for the further development of the projects foreseen in the strategic program and takes note of the requested funding of USD 7 million in grant funding and USD 9 million in concessional financing;

b) reconfirms its decisions on the allocation of resources, adopted at its meetings in June 2010 and 2011, that a range of funding for the regional program, consisting of strategic programs for the participating countries and a regional component, should be used as a planning tool in the further development of project and program proposals in participating countries to be submitted to the PPCR Sub-Committee for PPCR funding approval, recognizing that the minimum amount of the range is more likely and that the upper limit of the range will depend on availability of funding. The range of funding agreed for a regional pilot program is USD 60-75 million in grant resources, and USD 36 million in other concessional resources;

c) further recognizes that the quality of the proposed activities will be a significant factor in the funding to be approved by the Sub-Committee when the project proposal is submitted for approval of PPCR funding;

d) invites the pilot countries and the MDBs to confirm, once all country pilots and the regional track of the regional program have been endorsed and recognizing that the Caribbean regional program is comprised of six country pilots and a regional track of activities, the allocation of resources to each pilot and the regional track, bearing in mind the above range of resources that may be available for the regional program;

e) approves a total of USD 235,000 in PPCR funding as a preparation grant for the proposed project to be developed under the SPCR with the following 3 components, implemented by IBRD:

   i. *Promotion of Food Security Through Climate Resilient Agricultural/Fisheries Development;*

   ii. *Comprehensive Risk Management Framework and Sustainable Climate Change Financing; and*

   iii. *Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements.*

e) takes note of the estimated budget for project preparation and supervision services for the project listed in the SPCR and approves USD 245,000 as a first tranche of funding for such preparation and supervision services to be provided by IBRD**;**

f) requests the Government of Dominica and the IBRD to take into account written comments submitted by Sub-Committee members by May 11, 2012 in the further development of the project under the SPCR.

Government of Dominica

OFFICE OF THE PRIME MINISTER

Tel: (767) 448 2401 Ext. 3300
Fax: (767) 448 4506
Email: pmoffice@cwdom.dm

Financial Centre
Roseau
Commonwealth of Dominica

5th April 2012

Ms. Patricia Bliss-Guest
Programme Manager
Administrative Unit
Climate Investment Funds
World Bank, 181 8 H Street NW, MC5-522
Washington D.C. 20433, USA
Fax: (202) 522 2937
Phone: (202) 458 1801

Dear Ms. Patricia Bliss-Guest,

Re: *Dominica's Low Carbon Climate Resilient Development Strategy* and *Strategic Programme for Climate Resilience* (SPCR)

I am pleased to submit *Dominica's Low Carbon Climate Resilient Development Strategy* and compendium *Strategic Program for Climate Resilience* (SPCR) for consideration by the Sub-Committee of the Pilot Program for Climate Resilience (PPCR). Dominica is honoured to be one of the countries selected to be a pilot under the PPCR programme, and is grateful to the Climate Investments Funds, the World Bank and other development partners for assistance that has been provided to formulate *Dominica's Low Carbon Climate Resilient Development Strategy* and compendium *Strategic Program for Climate Resilience* (SPCR) document through a broad-based consultative process including major development Partners, civil society and the private sector. The Strategy has been approved by the Government of Dominica.

Dominica's *Low Carbon Climate Resilient Development Strategy*, which should be read in concert with the SPCR document, describes Dominica's development context and the constraints/challenges to sustainable development from climate change. It provides a review of climate change adaptation activities and how lessons learned from previous experiences are being used to foster an integrated strategic approach to address these vulnerabilities.

Most importantly, Dominica's *Low Carbon Climate Resilient Development Strategy* articulates, for the first time in the country, a strategic vision with clearly defined goals/activities to support the country's transformation to a low-carbon climate resilient development path within my government's national development planning process.

.../2

The compendium *Strategic Program for Climate Resilience* (SPCR) provides the rationale for PPCR support and the description of proposed SPCR investments, while also providing a detailed description of SPCR implementation and governance arrangements with specified roles and responsibilities of national agencies. Read together, these strategic documents establish the enabling framework to ensure that Dominica, the ***Nature Island of the Caribbean***, will achieve its sustainable development aspirations while meeting critical social development and poverty reduction goals.

By addressing the deficiencies identified during the SPCR priority planning process, SPCR interventions will support ***the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a low-carbon climate resilience development pathway that can serve as a model for other small island developing States in the region.*** By positioning climate change as a development issue rather than an environmental issue, Dominica's SPCR has the opportunity to demonstrate viable interventions to address climate change risks within the context of a national development framework that establishes the country firmly on the path to a Green Economy.

Subject to the availability of resources in the regional PPCR funding envelope, the Government of Dominica is requesting US$7 million in grants and concessional loans of US$9 million. However, it should be noted that the Government and people of Dominica incur an increasingly heavy financial burden to address costs associated with climate change and climate variability, which in 2011 amounted to a sum in excess of US$100 million for damages from extreme weather events that are increasing in frequency and intensity. These re-occurring and ever growing costs constitute a severe impediment to the economic, social and environmental development aspirations of the country, and detract much needed funding from Dominica`s development and poverty alleviation programmes. My Government would like to place on record that the available PPCR grant envelope is insufficient to implement priority measures that are urgently needed to address current exposure to climate change risks, and would therefore welcome additional funding from the CIF if funds were to become available.

We look forward to the favourable consideration of our *Strategic Program for Climate Resilience* (SPCR) and Project Preparation Grant request.

Yours sincerely,

.....

HON. ROOSEVELT SKERRIT
PRIME MINISTER AND MINISTER FOR FINANCE

CIF Climate Investment Funds

DOMINICA

STRATEGIC PROGRAM FOR CLIMATE-RESILIENCE (SPCR)

2012-2017

Table of Contents

List of Abbreviations and Acronyms

ACCC	ADAPTING TO CLIMATE CHANGE IN THE CARIBBEAN
CARIBSAVE	CARIBBEAN SECTORAL APPROACH TO VULNERABILITY AND RESILIENCE
CARICOM	CARIBBEAN COMMUNITY
CCCCC	CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE
CCCCE-ARK	CLIMATE CHANGE COASTAL COMMUNITY ENTERPRISES-ADAPTATION RESILIENCE KNOWLEDGE
CDB	CARIBBEAN DEVELOPMENT BANK
CDEMA	CARIBBEAN DISASTER EMERGENCY MANAGEMENT AGENCY
CEHI	CARIBBEAN ENVIRONMENTAL HEALTH INSTITUTE
CIDA	CANADIAN INTERNATIONAL DEVELOPMENT AGENCY
CIF	CLIMATE INVESTMENT FUND
CPA	COUNTRY POVERTY ASSESSMENT
CPACC	CARIBBEAN PLANNING FOR ADAPTATION TO CLIMATE CHANGE
CREP	CARIBBEAN REGIONAL ENVIRONMENTAL PROGRAMME
DFID	UNITED KINGDOM DEPARTMENT FOR INTERNATIONAL DEVELOPMENT
EU-ACP	EUROPEAN UNION - AFRICA CARIBBEAN PACIFIC
GEF	GLOBAL ENVIRONMENT FACILITY
GHG	GREENHOUSE GAS
GIS	GEOGRAPHIC INFORMATION SYSTEM
IDB	INTER-AMERICAN DEVELOPMENT BANK
INC	INITIAL NATIONAL COMMUNICATION
JICA	JAPANESE INTERNATIONAL COOPERATION AGENCY
MACC	MAINSTREAMING ADAPTATION TO CLIMATE CHANGE
MDB	MULTILATERAL DEVELOPMENT BANK
MEA	MULTI-LATERAL ENVIRONMENTAL AGREEMENT

MIF	MULTILATERAL INVESTMENT FUND
NCCC	NATIONAL CLIMATE CHANGE COMMITTEE
NCSA	NATIONAL CAPACITY SELF ASSESSMENT
OAS	ORGANISATION OF AMERICAN STATES
OECS	ORGANISATION OF EASTERN CARIBBEAN STATES
PAHO	PAN AMERICAN HEALTH ORGANISATION
PMU	PROJECT MANAGEMENT UNIT
PPCR	PILOT PROGRAMME FOR CLIMATE RESILIENCE
SCF	STRATEGIC CLIMATE FUND
SIDS	SMALL ISLAND DEVELOPING STATE
SLM	SUSTAINABLE LAND MANAGEMENT
SNC	SECOND NATIONAL COMMUNICATION
SPACC	SPECIAL PROGRAMME ON ADOPTION TO CLIMATE CHANGE
SPCR	STRATEGIC PROGRAMME FOR CLIMATE RESILIENCE
USD	UNITED STATED DOLLAR
UNDP	UNITED NATIONS DEVELOPMENT PROGRAMME
UNECLAC	UNITED NATIONS ECONOMIC COMMISSION FOR LATIN AMERICA & THE CARIBBEAN
UNEP	UNITED NATIONS ENVIRONMENT PROGRAMME
UNFCCC	UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE
UWI	UNIVERSITY OF THE WEST INDIES
V&A	VULNERABILITY AND ADAPTATION
WB	WORLD BANK

Summary of Dominica's Strategic Program for Climate Resilience		
1. **Country/Region**:	Dominica	
2. **PPCR Funding Request (in USD million):**:	*Grant:* $7 million[1]	*Loan:*- $9 million
3. **National PPCR Focal Point**:	Lloyd Pascal, Director, Environmental Coordinating Unit, Ministry of Environment, Physical Planning, Natural Resources and Fisheries	
4. **National Implementing Agency** (Coordination of Strategic Program)**:**	Ministry of Finance Environmental Coordinating Unit of the Ministry of Environment, Physical Planning, Natural Resources and Fisheries	
5. **Involved MDB**	World Bank, Inter-American Development Bank, International Financial Corporation	
6. **MDB PPCR Focal Point and Project/Program Task Team Leader (TTL)**:	*PPCR – Focal Point :* Kanta K. Rigaud	*TTL:* Tiguist Fisseha World Bank, Latin America and the Caribbean Division IDB Representative: Gerard Alleng IFC Representative: Marco Giussani

[1] SPCR request is for US $7 million in grants and $ 9 million in loans, with the understanding that there is a range in each case (US$5-7 million in grant and US$4-9 million in loan), and that the lower end will apply if the envelope for the Caribbean Regional Program materializes at the lower end of the projected range.

Description of SPCR:

Dominica is located at 15 degrees North and 61 degrees West, occupying a central position in the eastern Caribbean archipelago. The island is approximately 750.6 square kilometers and is the largest in the Windward and Leeward groups of the Eastern Caribbean.

Dominica is volcanic in origin and is characterized by very rugged and steep terrain with approximately ninety miles of coastline. A chain of mountains extends from the islands center to the south and the topography is characterized by a number of ridges and steep river valleys with gently sloping lands being restricted to narrow coastal strips, particularly in the center and northeast of the island. The islands volcanic natural history remains evident in continuing seismic activity and in scenic attractions such as the Valley of Desolation and the Boiling Lake, which together with dense forests populated with an abundance of natural lakes and waterfalls, provide the basis for a growing eco-tourism industry. Dominica has a forest area of 45 000 hectares – constituting more than half of the island's 75 000 hectare over all land area.

Dominica had a population of approximately 71,000 persons (a decline from 74,750 in 1994), including two thousand Kalinagos, the remaining survivors of the first inhabitants of the island. Topographic conditions have forced human settlements onto narrow coastal areas particularly in the south and west with approximately 44,000 persons (62%) living along the coast. The 2002 Country Poverty Assessment (CPA) found that poverty in Dominica was high by Caribbean standards - around 29% of households and 39% of the population. Around 10% of households and 15% of the population are indigent (i.e. very poor), with poverty being found in both urban and rural areas, although three quarters of poor households live in rural areas where one in every two households is poor.

Dominica, by its very nature is vulnerable, given its susceptibility to natural disasters and its ecological and economic fragility. Vulnerability to climate change in Dominica, like many developing countries, is aggravated by external pressures affecting its resilience and adaptive capacity such as terms of trade, impacts of globalisation (both positive and negative), financial crises, international conflicts, external debt, and internal local conditions such as population growth, incidence of poverty, political instability, unemployment, reduced social cohesion, and a widening gap between poor and rich, together with the interactions between them. It is widely acknowledged that climate change will exacerbate impacts from natural disasters with enormous human and economic costs.

Recognising the threats posed by climate change, Dominica has, over the last two decades, undertaken a number of initiatives to respond to this threat. Dominica has established a strong track record on climate change adaptation, and in this regards was one of the few countries chosen to pilot adaptation measures under the *Special Program on Adaptation to Climate Change* (SPACC). Additionally, as a collaborative initiative between the SPACC program and the GEF-funded *Sustainable Land Management* (SLM) project, Dominica has pioneered: (a) the vulnerability mapping and "climate proofing" of National Parks Management Plans; and (b) community-based vulnerability mapping and the development, through community engagement and input, of community adaptation plans.

(a) Key challenges related to vulnerability to climate change/variability:

Dominica has made considerable progress in implementing *Stage 1* adaptation measures. However, the implementation of *Stage 2* and *Stage 3* measures have not been possible due to serious resource (human, technical, financial) constraints. The PPCR *National Adaptive Capacity Assessment* identified *considerable limitations in climate change risk management capacity* at the systematic, institutional and individual levels, at the national, sectoral, district and local level, and within the public sector and civil society, highlighting the *need for considerable capacity building*. The *National Adaptive Capacity Assessment* confirmed the need for improved levels of *earmarked financial resources for climate change risk management and resiliency building* as articulated in the NCSA, and the need for *improved coordination* amongst key state and non state actors involved in climate change risk management. Other identified key challenges include:

- Critical infrastructure in the country is vulnerable to significant loss and damage from extreme weather events, sea level rise and storm surges;
- Lack of systems, expertise and facilities to collect, store and analyze relevant information and data on topics related to climate change;
- Inadequate knowledge and awareness of potential impact of climate change and lack of technical skills to address them;
- Policies, laws, rules and regulations related to climate change and disaster risk reduction need strengthening and the capacity to enforce these revised regulations need enhancement; and
- Planning for coordinated response to climate change and disaster risk reduction activities need improvement.

(b) Areas of Intervention – sectors and themes

By addressing the deficiencies identified during the SPCR priority planning process, SPCR interventions will support *the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a low-carbon climate resilience development pathway that can serve as a model for other small island developing States in the region.* By positioning climate change as a development issue rather than an environmental issue, Dominica's SPCR has the opportunity to demonstrate viable interventions to address climate change risks within the context of a national development framework that establishes the country firmly on the path to a Green Economy.

SPCR interventions will be sustained in the long-term by ensuring that climate change planning/management becomes an *integral part of the national development planning process* under Dominica's *Growth and Social Protection Strategy* (GSPS) and *Low Carbon Climate Resilient Development Strategy* – the latter Strategy have been formulated under the SPCR planning process. In supporting the *transition from government being solely responsible for climate change risk management to a country where this is a shared responsibility*, SPCR interventions have to opportunity to demonstrate a model for transformation changes that could benefit other developing countries. Sustainability will be achieved by establishing *effective partnerships* with all stakeholders (public sector and civil society, technical and financial partners, local governments, vulnerable communities, grass-roots organizations) to transform Dominica to a low-carbon climate resilient country that will make a significant contribution to sustainable development in the country, and add value by ensuring that the SPCR is not a stand alone activity*, but becomes a responsibility assumed by all stakeholders.*

The following priority investments for support under Dominica SPCR were identified:

Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development

The objective of this component is to build climate resilient communities by strengthening capacity to address climate change risks to food security associated with changing precipitation patterns. Component 1 will support the following activities:

(i) Formulation of *Water Resource Inventory* (surface and ground water resources), water balance assessment, continued monitoring of water resources, installation of hydro-met and coastal monitoring stations (including for automatic hydro-met and coastal monitoring equipment) to support establishment of community early-warning systems development (see Component 3 (ii) below) and formulation of *Integrated Natural Resource Management Plan* (see sub-Component ii) that will, inter alia, guide water conservation, extraction and use;

(ii) Development of *Land Use Capability,* and *Integrated Natural Resources Management Plan* and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB) to regulate development in coastal and watershed areas, prevent pollution, regulate the extraction, conservation of water, and determine sustainable irrigation levels.

(iii) Establishment of *food security program* (to be scaled up and replicated with support under Adaptation Fund) involving:

1. design and construction of a pilot rain-fed organic greenhouse, drip irrigation, and organic food processing/storage facility utilizing renewable energy sources to demonstrate technical/financial viability to support scaling up and replication;
2. community-based pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability in Dominica with a view to replication in other vulnerable coral reef areas.

Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing. Component 2 will support the following capacity building activities:

(i) Financing of key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under ***Dominica`s Low Carbon Climate Resilient Development Strategy***;

(ii) design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels to be coordinated by the Division of Environment, Climate Change and Development (DECCD);

(iii) community vulnerability mapping and adaptation planning undertaken for all Dominica (based on process piloted under SLM and SPACC projects) and integrated into National Physical Development Plan being developed with support from CDB – see Component 1 (ii);

(iv) legal establishment of *Climate Change Trust Fund* in addition to US$1 million seed funding to the *Climate Change Trust Fund* to provide support to priority community climate change risks management measures identified through community vulnerability mapping and adaptation planning;

(iv) establishment of micro-finance and micro-insurance for private sector and vulnerable segments of society (farmers, fisherfolk, women and vulnerable communities in particular the Kalinago people);

(vi) establishment of climate change adaptation standards for the private sector.

Component 3 - Enhancing Infrastructure Resilience and Promotion of Sustainable Human Settlements
The objectives of this component are to establish the enabling environment whereby government, households and individuals assume the lead role in building resilient communities by addressing climate change risks to critical infrastructure. Component 3 will build climate change resilience in vulnerable communities, including through:

(i) establishment of community early warning systems based on real-time hydro-met data – see Component 1 (i);

(ii) design, retrofitting/construction of at least three pilot multi-use climate resilient and energy efficient emergency shelters (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources;

(iii) design and implementation of a climate change risk management training program for Ministry of Public Works staff to climate proof the design, construction and maintenance of critical infrastructure including roads – with infrastructure climate proofing to be funded under IDA, Regional IDA and possibly IBRD loans.

(c) Expected Outcomes from the Implementation of the SPCR
Key outcomes include: i) the establishment of an enabling environment to mainstream climate change risk management into national planning processes at the national, sectoral and community level and within the private sector. and ii) increased resilience in economic, social, infrastructural and eco-systems to climate variability and climate change through transformed social and economic development; iii) Climate change risks formally integrated into national physical (core) planning processes; and iv) replication and knowledge sharing of Dominica SPCR lessons learned in non-PPCR CARICOM countries and SIDS

7. **SPCR Outputs and Outcomes**		
Result	**Success Indicator(s)** **Outputs**	**Success Indicator(s)** **Outcomes**
Enabling environment created for a low carbon, climate resilient development path in Dominica	• Cabinet approved of ***Dominica's Low Carbon Climate Resilient Development Strategy*** demonstrating highest level government commitment to transformational change. • Established legal and institutional framework to facilitate/coordinate climate change and development planning/management. • Government mobilizes resources after 5 year SPCR investments to sustain timely/effective implementation of ***Dominica's Low Carbon Climate Resilient Development Strategy.***	• Increased resilience in economic, social, infrastructural and eco-systems to climate variability and climate change through transformed social and economic development. ***Indicator: Reduced annual budgetary allocation for addressing impacts from climate change and climate variability and corresponding increase in social/economic development spending.*** • Climate change risks formally integrated into national physical planning processes. ***Indicator: 20 local area physical plans and strategies integrating climate resiliency aspects*** • Replication and knowledge sharing of Dominica SPCR lessons learned in non-PPCR CARICOM countries and SIDS ***Indicator; 10 knowledge exchange events attended in the region where Dominica has shared its experiences and lessons learned and 30 national meetings where lessons learned and experiences have been shared with national stakeholders.***

Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development	• *Water Resource Inventory* (surface and ground water resources) completed for Dominica and integrated into National Physical Development Plan; • National system of hydro-met and coastal monitoring stations installed; • Early-warning systems established and operational in vulnerable communities; • *Integrated Natural Resource Management Plan* completed and integrated into National Physical Development Plan; • *Dominica`s food security program* developed and funded under Adaptation Fund); • Pilot rain-fed organic greenhouse, drip irrigation, and organic food processing/storage facility established and replicated in vulnerable communities; • Pilot community-based pilot transplanting and restocking of climate resilient corals undertaken and replicated in vulnerable coral reef areas.	• Reduced levels of poverty and improved quality of life of people living in areas most affected by climate variability and climate change; ***Indicator: Reduced levels of poverty in 30 vulnerable communities as recorded in periodic Country Poverty Assessment (CPA)*** • Improved government capacity for assessment and management of Dominica's water supply; ***Indicator: 50 physical planning decisions based on the use of sound hydro-met and coastal data*** • Improved land use planning ***Indicator: 5% increase in agricultural production*** ***5% decrease in water use for irrigation*** ***2% increase in climate resilient coral reef area in project area***

Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing	• Government agency responsible for coordinating climate change programming legally established and operational; • Pool of national experts trained in climate change adaptation and disaster risk management under education and awareness program; • community vulnerability maps and adaptation plan developed for all Dominica and integrated into National Physical Development Plan; • *Climate Change Trust Fund* legally established and operational; • Priority private sector and community risk management measures implemented with support from *Climate Change Trust Fund;* • micro-finance and micro-insurance established and providing support to private sector and vulnerable segments of society; • climate change adaptation standards established and in operation for OECS private sector.	• Improved institutional structure and processes to respond to climate variability and climate change. ***Indicator: Cabinet decision adopting legislation to establish government agency coordinating climate change and ensuing passage of legislation through House of Assembly.*** • Dominica vulnerable segments of society more resilient to climate change impacts. ***Indicator: 40 communities mapped as vulnerable and targeted for climate interventions*** ***200% increase in funding for climate-related activities at the community level*** • Dominica less reliant on external support for climate change programming at community level. ***Indicator: 200% increase in financing for climate-related activities at the community level***

Component 3 - Enhancing Infrastructure Resilience and Promotion of Sustainable Human Settlements	• Early warning systems and community preparedness programs established and operational in vulnerable communities; • Pilot multi-use climate resilient and energy efficient emergency shelters established and replicated in vulnerable communities; • Ministry of Public Works staff incorporate climate change risk management into day-to-day design, construction and maintenance of critical infrastructure;	• Critical infrastructure more resilient to climate change impacts • Increased level of security for the people of Dominica through risk awareness and access to emergency shelters ***Indicator: 10 emergency shelters established in areas mapped as vulnerable*** ***500% increase in number of communities reached with early warning messages (radio, text messages, TV, other means)*** ***10 staff of Ministry of Public Works (and Ministry of Finance) receiving training on climate-related issues and infrastructure.*** ***5 relevant training courses offered.***

8. **Project and Program Concepts under the SPCR:**							
Project/Program Concept Title	**MDB**	**Requested PPCR Amount ($)**[2]			**Expected co-financing and parallel financing ($)**	**Preparation grant request ($)**	**Total PPCR request**
		TOTAL	**Grant**	**Loan**			
Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development	IBRD	$2.5m	$2.5 m		$11.25 m	$235,000	$2.5 million (grant)
Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing	IBRD	$7.3m	$3.3 m	$4m	$0.4 m		US$7.3 million (grant and loan)
Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements	IBRD	$6.2m	$1.2m	$5m	US$43m		US$6.2 million (grant and loan)
	TOTAL	$16m	$7m	$9m	US$54.65m	$235,000	US$16 million (grant and loan)

9. **Timeframe** (tentative) – Approval Milestones

SPCR expected PPCR-SC approval date Mid-May 2012. Component 1 – 3: Project Preparation Grant Agreement signed between Government of Dominica and IBRD by Mid-June 2012; Detailed project preparation July 2012 – March 2013; Final SPCR approval by PPCR-SC – Jan/Feb 2013; IBRD Board approval May 2013.

10. **Key national stakeholder Groups involved in SPCR design**[3]:

Ministry of Finance, National Climate Change Focal Point, National Sector Agencies, vulnerable communities (including women), civil society (including private sector).

11. **Other Partners involved in developing Dominica SPCR:**

IDB, IFC, CDB, UNDP, UNECLAC, OAS, OECS, CIDA, DFID, JICA, CCCCC, CEHI, UWI.

[2] Includes preparation grant and project/program amount.

[3] Other local, national and international partners expected to be involved in design and implementation of the strategy.

I. INTRODUCTION

1. Based on recommendations of an independent Expert Group, Dominica has been selected as one of the countries to participate in the *Pilot Program for Climate Resilience* (PPCR) which is part of the *Strategic Climate Fund (SCF),* a multi-donor Trust Fund within the *Climate Investment Funds* (CIF). The Caribbean PPCR has seven components: country activities in six countries (Dominica, Grenada, Haiti, Jamaica, Saint Lucia, St. Vincent and the Grenadines) and a region-wide component. The PPCR will provide financing through the multilateral development banks (MDBs) to support programs in the selected pilot countries. Proposals for PPCR funding will be prepared jointly by the recipient country and the relevant MDBs.

2. The goal of the *Pilot Program for Climate Resilience* (PPCR) is to help countries ***transform to a climate resilient development path, consistent with national poverty reduction and sustainable development goals.*** In its nature as a pilot program and supporting learning-by-doing, PPCR implementation ultimately aims to result in an *increased application of knowledge on integration of climate resilience into development*. The PPCR will complement, yet go beyond, currently available adaptation financing in providing finance for *programmatic approaches* to upstream climate resilience in development planning, core development policies, and strategies.

3. Dominica has been provided Technical Assistance (TA) to undertake the design and development of this ***Strategic Program for Climate Resilience*** (SPCR). In light of the need to develop a strategic approach to climate change management as identified by stakeholders during the comprehensive and country-driven SPCR planning process, the TA also supported the development of **Dominica's *Low Carbon Climate Resilient Development Strategy*** that constitutes a compendium first part to this SPCR. **Dominica's *Low Carbon Climate Resilient Development Strategy***, which should be read in concert with this document, describes Dominica's development context and the constraints/challenges to sustainable development from climate change. It provides a review of climate change adaptation activities and how lessons learned from previous experiences are being used to foster an integrated strategic approach to address these vulnerabilities. Most importantly, **Dominica's *Low Carbon Climate Resilient Development Strategy*** articulates, for the first time in the country, a strategic vision with clearly defined goals/activities to support the country's transformation to a low-carbon climate resilient development path within the government's national development planning process.

4. This ***Strategic Program for Climate Resilience*** provides the rationale for SPCR support and the description of proposed SPCR investments, while also providing a detailed description of SPCR implementation and governance arrangements with specified roles and responsibilities of national agencies. The Annexes provide more details on the SPCR planning process including the risk assessments and capacity assessments that have been undertaken as part of the process to support stakeholder identification of priority SPCR investments, as well as detailed descriptions of project components including their sustainability, monitoring and evaluation, budget and a timetable.

Part 1 – Background and Rationale

5. **Dominica's *Low Carbon Climate Resilient Development Strategy*** provides an overview of the country circumstances, the development context and identifies climate change vulnerabilities in key sectors, for specifically vulnerable groups, for the private sector, important eco-systems and natural resources. It also provides an overview of linkages to existing development plans and programs, most importantly Dominica's *Growth and Social Protection Strategy* (GSPS) and Dominica's *National Climate Change Adaptation Policy.* Section 5 of **Dominica's *Low Carbon Climate Resilient Development Strategy*** contains a policy, legal and institutional analysis that list key agencies involved in managing climate change risks, together with the associated legal/policy framework.

II. Dominica's SPCR Prioritization Planning Process

6. **Dominica's *Low-Carbon Climate Resilient Development Strategy*** and this compendium SPCR have been developed through an extensive consultative process that was supported under the Pilot Program for Climate Resilience (PPCR) funded under the Climate Investment Funds (CIF). As part of the process to develop **Dominica's *Low-Carbon Climate Resilient Development Strategy*** and SPCR*, v*arious assessments and studies were undertaken and reviewed with and by national stakeholders to provide the technical foundation for the preparation of the Strategy and this compendium SPCR. Key steps in Dominica's SPCR prioritization planning process included:

(a) ***Document stocktaking, review and analysis*** including a critical review of *Dominica's Climate Change Adaptation Policy and Action Plan* (2002) (endorsed by Cabinet in 2002) that was developed with support under the *Caribbean Planning for Adaptation to Climate Change* project, and analysis of current and ongoing national development policies, programs and initiatives in particular the Government of Dominica's *Growth and Social Protection Strategy* (GSPS) which articulates a medium-term strategy for growth and poverty reduction over the next five years and sets priorities to make poverty reduction the principal focus of Government's economic and social policy;

(b) Broad-based stakeholder ***climate change risk assessment*** (including prioritization and ranking of climate change risks affecting Dominica) adapted from the risk assessment approach/methodology/guidelines developed under the *Adapting to Climate Change in the Caribbean* (ACCC) project and based on climate change trend analysis and projections contained in Dominica's *Initial National Communication* (INC) and *Second National Communication* (SNC) to the UNFCCC;

(c) Critical review of Dominica's *National Capacity Self Assessment (NCSA)* and an ***Adaptive Capacity Assessment*** (assessing institutional, systematic, individual capacity) for public and private sector, vulnerable communities/sectors that served to update and validate recommendations contained in the NCSA;

(d) ***Community Surveys*** undertaken to identify climate change vulnerabilities, capacities and priority needs that built upon community vulnerability mapping and adaptive capacity assessments undertaken under Dominica's *Sustainable Land Management* project and *Special Program on Adaptation to Climate Change* (SPACC) project;

(e) Identification of ***priority needs and investment opportunities*** to facilitate Dominica's transformation to a climate-resilient development path that was undertaken during the SPCR National Consultative Workshop;

(f) ***Cost-benefit Analysis*** of proposed SPCR investment opportunities that was undertaken with technical support/methodologies provided by the Caribbean Community Climate Change Center (CCCCC) under Phase 1 of the regional track SPCR program.

A list of stakeholders consulted during SPCR preparation is contained in *Annex 1.*

III. RATIONAL FOR PPCR SUPPORT

7. The ***climate change risk assessment*** built upon the ***Stocktaking*** and ***Institutional Analysis*** undertaken under the *National Capacity Self Assessment* (NCSA) and the vulnerability assessments undertaken to develop Dominica's *Climate Change Adaptation Policy, Initial National Communication* and *Second National Communication* (SNC). The climate change risk assessment was modeled on the process outlined in the *Risk Management Guidelines for Climate Change Adaptation Decision Making*[4]***.*** Using a multiple criteria analysis[5] (see *Annex 2*), each PPCR Technical Working Group (TWG) undertook a sector specific assessment as follows:

(a) Identification of ***event risks*** and ***outcomes risks*** based on vulnerability assessments contained in Dominica's *Initial National Communication*, *National Climate Change Adaptation Policy*, and *Second National Communication*;

(b) Ranking of event/outcome risks in terms of ***severity of social/ economic/ environmental/ impacts*** (11 indicators used for ranking);

(c) ***Probability/frequency analysis*** on prioritized event/outcome risks that scored the highest in terms of severity of social/economic/environmental/impact;

(d) Once each sector TWG had completed the sectoral risk assessment – stakeholders during the National Consultative Workshop verified the outcomes and developed the list of national priority risks based on top ranked risks for each sector.

Through this ***climate change risk assessment***, national stakeholders identified the following as priority risks from climate change:

---

[4] Developed under the "*Mainstreaming Adaptation to Climate Change*" and "*Adapting to Climate Change in the Caribbean*" (ACCC) projects funded by GEF/World Bank/CIDA. 2003.

[5] The following criteria were considered by stakeholders to assess climate change risks:
- magnitude of impacts,
- timing of impacts,
- persistence and reversibility of impacts,
- likelihood (estimates of uncertainty) of impacts and vulnerabilities, and confidence in those estimates,
- potential for adaptation,
- distributional aspects of impacts and vulnerabilities,
- importance of the system(s) at risk.

Table 1 - SUMMARY OF CLIMATE CHANGE RISKS

Event Risks and *Outcome Risks*	Ranking of Risks (10 highest)
Increase in extreme events and climate variability (Cumulative Risks) - ***Physical damage to crops and agricultural access roads, impact on agricultural and fisheries productivity, increase of pests/disease, impact on livelihoods and food security***	**10**
Increase in extreme events - ***More frequent economic setbacks, prolonged recovery periods, stress on economy (including increase in loss of life, impact on tourism arrivals, impact on agricultural production, food security, forest cover), and less attractive environment for foreign investment due to cumulative destruction of critical infrastructure for tourism, manufacturing, agriculture, trade***	**10**
Increase in extreme events (increased intensity of hurricanes, flooding, landslides) – ***Increased damage to houses, human settlements, critical infrastructure, business and other properties***	**10**
Sea level rise – combined with increased incidents of storm surges - ***Damage to coastal infrastructure (roads, ports, jetties, storage, processing, packing, landing sites) used for agricultural trade and access to markets***	**9**
Increased frequency of extreme events - ***Water shortages due to increased drought and storms*** (Note: includes loss to crops)	**9**
Sea level rise – combined with increased incidents of storm surges - ***Damage to coastal tourism facilities (beaches, hotels, airports, cruise ship terminals)*** (NOTE: Includes impacts on Kalinago people and lost income to farmers)	**8**
Sea level rise and storm surge - ***Loss of coral reefs – loss of protection to coastal areas and impact of marine ecosystem and associated effect on livelihoods and food security***	**8**
Climate variability - ***Loss and impact on marine and terrestrial biodiversity which is key pillar for tourism***	**8**
Changes in rainfall intensity -***Increased coastal marine habitat degradation and damage to fisheries infrastructure***	**8**
Increased climate variability - ***Changes in fish and marine mammal migration patterns affecting food security and tourism***	**8**
Changes in rainfall patterns - ***Increased incidents of landslides affecting houses, human settlements and infrastructure, in addition to costs for insurance and building loans***	**8**

Increase in extreme events – ***Damage to coastal property and infrastructure due to storms surges***	**7**
Increase in extreme events - ***Reduced availability of international donor funding due to increased demand for emergency assistance from vulnerable countries***	**7**
Changes in national and local temperatures regimes - ***Increased damage to buildings and water cisterns from extreme dry conditions***	**7**
Sea level rise – combined with increased incidents of storm surges - ***Increased costs for insurance, re-insurance and costs to banks providing loans for coastal infrastructure***	**6**
Increased climate variability - ***Increased land degradation*** (variation in temperature) (Note: impact on food production, water quality, health and nutrition)	**6**
Changes in rainfall patterns - ***Impact on water quality/supply and costs of water treatment/delivery and damage to water/communication infrastructure*** (NOTE: hotels and restaurants at tipping point and loss of income due to lack of water could put them out of business)	**6**
Increased climate variability - ***Decline in tourism visitor arrivals due to more mild conditions affecting winter tourism market***	**6**
Sea level rise and storm surge - ***Damage to coastal infrastructure from sea level rise and higher storm surges and associated impact on tourism (hotels, dive industry, yachting)*** (Note: Significant cultural loss in Carib Territory and loss of beaches for recreation)	**6**
Increase in extreme events - ***Increase cost of coastal resources management***	**6**
Increase in extreme events - ***Damage to water infrastructure and impact on costs for water supply***	**6**

8. As part of the SPCR ***Adaptive Capacity Assessment***, a *National Adaptive Capacity Assessment* was undertaken (see *Annex 3*) to evaluate national adaptation capacity needs/ priorities. This assessment highlighted the fact that Dominica has made considerable progress in implementing *Stage 1* adaptation measures. However, the implementation of *Stage 2* and *Stage 3* measures have not been possible due to serious resource (human, technical, financial) constraints. The PPCR *National Adaptive Capacity Assessment* also identified ***considerable limitations in climate change risk management capacity*** at the systematic, institutional and individual levels, at the national, sectoral, district and local level, and within the public sector and civil society, highlighting the ***need for considerable capacity building***. The *National Adaptive Capacity Assessment* confirmed the need for improved levels of ***earmarked financial resources for climate change risk management and resiliency building*** as articulated in the

NCSA, and the need for ***improved coordination*** amongst key state and non-state actors involved in climate change risk management.

9. Additionally, using the household survey piloted under the SLM/SPACC projects, a community survey was undertaken during the SPCR prioritization planning process (see *Annex 4*) which served to refine and validate the risks/needs of vulnerable communities as articulated during community vulnerability mapping and adaptation planning undertaken during the SLM/SPACC projects. Building upon earlier analysis undertaken on climate change impacts on gender and other vulnerable segments of society (outlined in Section 9 and the Annex of Dominica's ***Low Carbon Climate Resilient Development Strategy)*** the household and community surveys highlighted ***concerns over food security***, the urgent need to provide vulnerable communities with ***micro-insurance and micro-finance*** to address risks from climate change extreme events (floods, drought, landslides, crop damage, loss of fishery) affecting subsistence agriculture/fishery production, and the urgent need for ***community based early warning systems, community-based vulnerability/hazard mapping, community multi-use emergency shelters,*** and ***community risk management frameworks.*** Improved access to readily available ***financing to support priority community-based adaptation projects*** was also been highlighted as a priority. These investments are urgently needed to support ***transformational change in vulnerable communities whereby households and individuals assume the lead role in building resilient communities rather than relying on overstretched government resources.***

10. While there are several sectors and issues identified by national stakeholders as being important to address climate change risks in Dominica, there are a few that require priority attention if mainstreaming of climate change adaptation is to be achieved. Outlined below are the issues considered by national stakeholders during the SPCR planning process to be a priority for Dominica, and which possess the greatest potential to contribute to the successful transformation of the country to a climate resilient low carbon development path.

(a) Development of a ***national strategy*** – adopted at the highest level - to guide and facilitate Dominica's transformation to a low-carbon climate-resilient economy while addressing pressing development, livelihood and poverty issues confronting the country;
(b) Addressing climate change ***mitigation measures*** on the basis that savings in energy costs will allow Dominica to invest more in priority and much needed ***adaptation measures***;
(c) Establishing the ***enabling legal/institutional framework to facilitate coordination/implementation*** of priority climate change measures and the mainstreaming of climate change activities into national, sectoral and community planning/development;
(d) ***Creating the supportive enabling framework whereby communities can manage their own climate change risks,*** thereby addressing climate change impacts on vulnerable sectors (particularly agriculture, fisheries and water resources) and threats to food security, human health, poverty alleviation, sustainable livelihoods and economic growth;
(e) Implementing measures that ***will have a positive impact on social capital, the quality of basic services, and natural resources that provide essential environmental services;***
(f) Facilitating ***capacity building*** through education, awareness and training programs on climate change risks and resiliency measures in order to strengthen capacity at the community and sectoral level, within municipalities and local authorities, and the private sector;

(g) Developing climate change adaptation ***standards and guidelines*** to support and facilitate climate change adaptation mainstreaming in the private sector;
(h) Establishing a ***sustainable financing mechanism*** to ensure timely and readily available financial support to implement priority climate change risks management measures by the private sector and vulnerable communities.

11. These strategic interventions comprise the key component activities that are to be supported under Dominica's SPCR (see Part II). By addressing the deficiencies identified during the SPCR priority planning process, SPCR interventions will support ***the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a low-carbon climate resilience development pathway that can serve as a model for other small island developing States in the region.*** By positioning climate change as a development issue rather than an environmental issue, Dominica's SPCR has the opportunity to demonstrate viable interventions to address climate change risks within the context of a national development framework that establishes the country firmly on the path to a Green Economy.

12. SPCR interventions will be sustained in the long-term by ensuring that climate change planning/management becomes an ***integral part of the national development planning process*** under Dominica's *Growth and Social Protection Strategy* (GSPS) and ***Low Carbon Climate Resilient Development Strategy***, the latter having been formulated during the SPCR planning process. In supporting the ***transition from the situation whereby government is solely responsible for climate change risk management to a country where this is a shared responsibility***, SPCR interventions have to opportunity to demonstrate a model for transformation changes that could benefit other developing countries. Sustainability will be achieved by establishing ***effective partnerships*** with all stakeholders (public sector and civil society, technical and financial partners, local governments, vulnerable communities, grass-roots organizations) to transform Dominica to a low-carbon climate resilient country that will make a significant contribution to sustainable development in the country, and add value by ensuring that the SPCR is not a stand alone activity***, but becomes a responsibility assumed by all stakeholders.***

IV. Institutional Analysis

12. Section 5 of **Dominica's *Low Carbon Climate Resilient Development Strategy*** provides an overview of key policies, legislation and agencies relating to climate change management in the country.

13. The Government of Dominica secured assistance from the Global Environment Facility (GEF) and United Nations Environment Programme (UNEP) to undertake a "*National Capacity Needs Self-Assessment for Global Environmental Management*" (NCSA). The NCSA process provided Dominica with the opportunity to conduct a thorough assessment of the capacity needs and constraints facing national efforts to improve environmental conservation and sustainable development programmes, and to meet global environmental management obligations as set

forth in the Rio Conventions[6] and related regional and international instruments.

14. The NCSA provides a detailed analysis of the institutional capacity framework that is needed to ensure effective implementation of requirements under the UNFCCC (and other Rio Conventions) and facilitate the identification of management strategies relevant to sound environmental management and sustainable development. More specifically, the NCSA:

(a) determined capacity needs with a view to implementing the overall national environmental objectives of the then Ministry of Agriculture and the Environment at the individual, institutional and systemic levels;
(b) assessed the capacity of the Environmental Coordinating Unit (ECU) to coordinate issues of sustainable development and to give support and guidance relevant to the needs/mandates of the respective ministries, agencies and parties;
(c) reviewed and tested national mechanisms for stakeholder participation in environmental management;
(d) identified conflicts and synergies among multi-lateral environmental agreements (UNCCD, UNCBD, UNFCCC), and among the stakeholders and ministries implementing activities under these agreements;
(e) assessed the institutional capacity of the various Divisions within the Ministry of Agriculture and the Environment and other Ministries to respond to the sustainable development objectives as required in the UNCBD, UNCCD and UNFCCC;
(f) developed a framework to facilitate accessing and preparation of future requests for external funding and assistance to implement the Rio Conventions.

15. The NCSA provided valuable strategic directions for the consolidation of environmental planning and management activities within the Environmental Coordination Unit (ECU). The NCSA provided a framework whereby it was possible to liaise with and share findings with other multi-sectoral initiatives and related initiatives and plans, whose focus on economic and social issues related to sustainable development, thereby complementing the focus of the NCSA on environmental issues. It also served to coordinate Dominica's goals and obligations under regional agreements such as the *St. Georges Declaration of Principles of Environmental Sustainability in the OECS* and the *Caribbean Regional Environmental Programme* (CREP) that also address the mainstreaming of climate change measures.

16. With its unprecedented focus on analysing issues that cut across the Rio conventions, the NCSA represented a critical step in their effective implementation by promoting a more integrated and synergistic approach to environmental management. The NCSA also built upon and supplemented the capacity assessment and capacity building components of ongoing activities related to each convention, including the INC, Dominica`s *Climate Change Adaptation Policy*, the biodiversity add-on project, the climate change add-on project and the Mainstreaming Adaptation to Climate Change (MACC) project. Finally, the NCSA established a basis for coordination with significant ongoing development and environmental management projects with thematic linkages to the goals of the conventions.

---

[6] The Rio Conventions include –

- the *United Nations Framework Convention on Climate Change* (UNFCCC);
- the United Nations Convention to Combat Desertification and Drought (UNCCD); and
- the Convention on Biological Diversity (CBD), and related international instruments include the Cartegena Protocol on Biosafety.

17. The NCSA has produced the following outputs:

(a) Building national capacity to take issues related to the three Conventions into account in national planning and strategy formulation;
(b) The identification and development of ways to coordinate and harmonize overlapping activities among the three Conventions and help to ensure effective national measures to protect the global environment;
(c) A comprehensive national action plan focused on capacity building that identifies overall goals, specific objectives to be achieved, and courses of action;
(d) Support for the transition from this enabling activity to the actual implementation of identified follow up measures addressing loss in biodiversity, losses in soil fertility and climate change;
(e) Enhanced general domestic awareness and knowledge about the three Conventions and their interrelationship; and
(f) Strengthened dialogue, information exchange and cooperation among all relevant stakeholders including governmental, non-governmental, academic and private sectors.

18. As part of the NCSA process, a stocktaking was undertaken to evaluate commitments and progress achieved in implementing the three Rio Conventions. Additionally, an assessment was undertaken of the linkages between thematic areas which provides an important opportunity to facilitate an integrated approach to implementation of the conventions at the local, national and regional levels, through greater understanding of the commonalities and overlaps between the conventions. These reports were presented at national workshops where stakeholders –

(a) reviewed the outcomes from the stocktaking and linkages reports;
(b) developed a list and description of capacity constraints and needs in the three thematic areas;
(c) identified priority cross-cutting issues and synergies;
(d) prioritized capacity constraints and needs, cross cutting issues impacting upon effective national implementation of national sustainable development policies the Rio Conventions, and opportunities for improving national capacity;
(e) developed a comprehensive national action plan focused on capacity building that identifies overall goals, specific objectives to be achieved, and courses of action.

19. The NCSA highlighted amongst other matters:

(a) the lack of formal institutional mechanisms for coordinated action and information sharing among government resource management agencies (either bilateral or multi-institutional);
(b) unclear and often overlapping institutional mandates;
(c) policies of the international agencies currently providing financial assistance to the country are sometimes in contradiction of Dominica`s environmental goals or government priorities, and are often in conflict with one another;
(d) monitoring and enforcement of environmental laws and regulations is inadequate, because of lack of resources, incomplete laws and regulations, and lack of cooperation and support of the police and judiciary;
(e) and finally, environmental laws are not binding on government activities which limits the capacity to manage resources sustainably or to generate public support for conservation.

20. The assessment of these issues was undertaken with the view to identifying inadequate existing institutional structures, legislation and policy, overlaps in legislation and institutional mandates, and ways of harmonizing institutions, laws and regulations to provide a more efficient legal, institutional and policy framework. The initial NCSA report was presented to a broad stakeholder group at a national workshop with policy makers in the key ministries and organizations. The results of this work, and its review at the workshop, formed the basis for the

development of the ***NCSA Strategy and Action Plan***, which was submitted to the Government of the Commonwealth of Dominica for approval.

NCSA Strategy and Action Plan

The list of stakeholders involved with climate change related activities include agencies which are involved in energy generation and distribution, transportation sector, research and development, education, agricultural production, resource mobilization, resource management, fuel importers and retailers, etc. These include the various departments of fisheries, forestry and wildlife, physical planning, disaster preparedness, agriculture, private sector etc. However principal among these is the Environmental Coordinating Unit (ECU).

The majority of the agencies surveyed are experiencing manpower shortage. This situation does not only have negative implications for the programmes which they are implementing but also limits their ability to implement additional ones especially these which are required given the new dispensation (e.g. Dominica's increasing number of initiatives as a result of the International Conventions). Many of the agencies expressed a desire for employing more specialize staff, but this was not possible. The lack of manpower also provokes frequent staff redeployment sometime to areas outside of staff competencies.

Another significant issue is government's inability to provide the departments with the funds required for optimum functioning. Departments surveyed reported being allocated significantly lower amounts than that requested, and even then some received less than their allocated amount. This situation may pose new challenges for the ECU, whose mandate may have to include mobilizing of external funding through the mechanisms of the various International Conventions, to employ specialist for programme implementation. The ECU must therefore be transformed /strengthened in order to meet these new challenges.

21. Key recommendations contained in the ***NCSA Strategy and Action Plan*** are as follows:

Strategy 1 – Establish National Advisory Committee to facilitate improved MEA implementation/coordination;
Strategy 2/3 - Improved Legal Framework to implement/coordinate MEAs;
Strategy 4 - National Strategy to implement MEAs;
Strategy 5 - Single National Reporting Framework for MEAs;
Strategy 6 – Strengthening Environmental Coordinating Unit (ECU) and provide sustainable source of funding to implement MEAs;
Strategy 7 - Strengthening National Parks Service;
Strategy 8 - Establish an Effective Physical Planning and Coastal Zone Management Capacity;
Strategy 9 – Improve Public Education on MEAs;
Strategy 10 – Develop Information Systems for improved implementation of MEAs.

22. Due to pressing resource (human, technical, financial) constraints, the Government of Dominica has been unable to implement most of the priority recommendations contained in the ***NCSA Strategy and Action Plan.*** SPCR will support the implementation of priority outstanding NCSA recommendations with a focus on climate change resilience building - as verified/updated through the SPCR planning process.

Part II – Proposed Investment Program Components for PPCR Finance

V. Outline of the Strategic Program for Climate Resilience

23. The process and steps required to mainstream climate change into national development planning in Dominica, and the rational for SPCR support are outlined in **Dominica's *Low Carbon Climate Resilient Development Strategy*** that constitutes a compendium first part to this SPCR, and includes the phasing of the needed actions and division of labor/financing between PPCR, the *Adaptation Fund, IDA, Regional IDA* and possible IBRD support. A short overview on components to be financed and implemented by the SPCR and other partners are also provided in **Dominica's *Low Carbon Climate Resilient Development Strategy***, which are as follows:

Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development

The objective of this component is to build climate resilient communities by strengthening capacity to address climate change risks to food security associated with changing precipitation patterns. Component 1 will support the following activities:

(i) Formulation of *Water Resource Inventory* (surface and ground water resources), water balance assessment, continued monitoring of water resources, installation of hydro-met and coastal monitoring stations (including for automatic hydro-met and coastal monitoring equipment) to support establishment of community early-warning systems development (see Component 3 (ii) below) and formulation of *Integrated Natural Resource Management Plan* (see sub-Component ii) that will, inter alia, guide water conservation, extraction and use;

(ii) Development of *Land Use Capability,* and *Integrated Natural Resources Management Plan* and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB) to regulate development in coastal and watershed areas, prevent pollution, regulate the extraction, conservation of water, and determine sustainable irrigation levels.

(iii) Establishment of *food security program* (to be scaled up and replicated with support under Adaptation Fund) involving:

1. design and construction of a pilot rain-fed organic greenhouse, drip irrigation, and organic food processing/storage facility utilizing renewable energy sources to demonstrate technical/financial viability to support scaling up and replication;

2. community-based pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability in Dominica with a view to replication in other vulnerable coral reef areas.

Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing. Component 2 will support the following capacity building activities:

(i) financing key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under **Dominica`s Low Carbon Climate Resilient Development Strategy;**

(ii) design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels to be coordinated by the Division of Environment, Climate Change and Development (DECCD);

(iii) community vulnerability mapping and adaptation planning undertaken for all Dominica (based on process piloted under SLM and SPACC projects) and integrated into National Physical Development Plan being developed with support from CDB – see Component 1 (ii);

(iv) legal establishment of *Climate Change Trust Fund* in addition to US$1 million seed funding to the *Climate Change Trust Fund* to provide support to priority community climate change

risks management measures identified through community vulnerability mapping and adaptation planning;
(v) establishment of micro-finance and micro-insurance for private sector and vulnerable segments of society (farmers, fisherfolk, women and vulnerable communities in particular the Kalinago people);
(vi) establishment of climate change adaptation standards for the private sector.

Component 3 - Enhancing Infrastructure Resilience and Promotion of Sustainable Human Settlements

The objectives of this component are to establish the enabling environment whereby government, households and individuals assume the lead role in building resilient communities by addressing climate change risks to critical infrastructure. Component 3 will build climate change resilience in vulnerable communities, including through:
(i) establishment of community early warning systems based on real-time hydro-met data – see Component 1 (i);
(i) design, retrofitting/construction of at least three pilot multi-use climate resilient and energy efficient emergency shelters (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources;
(ii) design and implementation of a climate change risk management training program for Ministry of Public Works staff to climate proof the design, construction and maintenance of critical infrastructure including roads – with infrastructure climate proofing to be funded under IDA, Regional IDA and possibly IBRD loans.

Detailed descriptions of the component activities are provided in *Annexes 5-7* to this SPCR.

VI. Budget

24. Based on available levels of CIF funding, the total budget for Dominica's SPCR is no less than US$7 million (grant) and US$9 million (loan)[7], with US$43 million being provided in co-financing, and US$11.65 million in parallel financing. Allocations by component are summarized below (all prices are in US$).

[7] The SPCR request is for US $7 million in grants and $ 9 million in loans, with the understanding that there is a range in each case (US$5-7 million in grant and US$4-9 million in loan), and that the lower end will apply if the envelope for the Caribbean Regional Program materializes at the lower end of the projected range

Component 1 Budget:

Budget Item	Grant Request	Co and Parallel Financing
Water Resource Inventory (surface and ground water resources), water balance assessment, continued monitoring of water resources, installation of ***hydro-met and coastal monitoring stations*** (including US$500,000 for hydro-met and coastal monitoring equipment).	1,000,000	250,000 (EU-ACP)
Development of ***Land Use Capability,*** and ***Integrated Natural Resource Management Plan*** and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB)	500,000	1,000,000 (CDB)
Food security program (supported by parallel financing from Adaptation Fund) – design and construction of a pilot rain-fed organic greenhouse, drip irrigation scheme, and organic food processing/storage facility utilising renewable energy sources to demonstrate technical and financial viability.	750,000	10,000,000 (Adaptation Fund)
Food security program - pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability with a view to replication in other vulnerable coral reef areas.	250,000	
TOTAL	**2,500,000**	**11,250,000**

Component 2 Budget:

Budget Item	Grant Request	Loan Request	Co Financing
Financing of key technical personnel for initial 5 year SPCR program needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under ***Dominica`s Low Carbon Climate Resilient Development Strategy***	500,000		150,000 (SLM)
Design/implementation of climate change adaptation and disaster risk management ***education/awareness*** program.	200,000		
Community vulnerability mapping and adaptation planning for all Dominica (based on pilot process developed under SLM) which is integrated into National Physical Development Plan being developed with support from CDB.	500,000		See Component 1 (ii)
Legal establishment of the *Climate Change Trust Fund* and seed funding to support ***financing of priority climate change risk management measures at community level***.	1,100,000		
Establish and operationalize ***micro-finance and micro-insurance program*** for private sector and vulnerable segments of society.		4,000,000	250,000 Micro Insurance Catastrophe Risk Organization[8]
Establishment of ***climate change adaptation standards*** (Private Sector).	1,000,000		
TOTAL -	**3,300,000**	**4,000,000**	**400,000**

[8] Caribbean Agriculture Fund

Component 3 Budget:

Budget Item	Grant Request	Loan Request	Co financing
Establishment of ***community early warning systems*** based on real-time hydro-met data.	500,000		43,000,000
Design, retrofitting/construction of at least three pilot ***multi-use climate resilient and energy efficient emergency shelters*** (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources, and build capacity to climate proof access roads to shelters – to serve as basis for building emergency multi-use shelters funded under IDA	500,000		
Capacity Building/training program in Ministry of Public Works to ***climate proof the design and construction of critical infrastructure*** including roads + Climate proofing of critical infrastructure - see note below	200,000	5,000,000	
TOTAL	**1,200,000**	**5,000,000**	**43,000,000**

25. * Note - The following priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** and SPCR will be co-financed under **IDA** (US$17.5 million loan), **Regional IDA** (Up to US$5.5 million (max) loan), and possibly **IBRD** support (US$20 million loan) in addition to the US$0.5 million (grant) for IDA project preparation activities and US$0.1 million (grant) for Phase 1 PPCR preparation activities:

Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements

(a) US$0.6 million (grant) to identify vulnerable infrastructure, evaluate climate change risks and technical solutions to address risks, improve and implement climate proof building codes and develop effective monitoring capability to build climate proof structures in the construction industry.

(b) Climate proofing of critical infrastructure, improving access to markets, and building climate resilient communities through:

- Integration of climate change considerations into national building codes and engineering design criteria;
- Construction of *coastal and river defences* - which are also a tourism product that addresses health and recreational impacts and beach enhancement;
- Improved transportation, processing, storage of agricultural/fisheries products and improved access to markets;
- Slope stabilization, retrofitting and *climate proofing primary and secondary roads and bridges*;
- Retro-fitting (climate proofing) houses, public buildings, and critical infrastructure;
- Construction of c*ommunity multi-purpose emergency shelters*;
- Effective and climate resilient *waste and waste-water treatment management*;
- Improved *climate resilient drainage*;
- *Maintenance of storm water drainage*;
- *Increased water storage and treatment capacity* the latter using renewable energy technologies.

26. A cost-benefit analysis on Proposed SPCR Interventions is included in *Annex 8*.

Climate Change - ***Progressively Increasing Costs to Dominica***

Hurricane Dean (August 2007) (Category 5 Hurricane):
Damage to farmers - $0.888 million
Government compensation to farmers $0.$636 million

Hurricane Omar (October 2008) (Category 4 Hurricane):
Damage to fisheries sector - $2 million
Government compensation to farmers - $1.6 million

Hurricane Tomas (October 2010) (Category 1 Hurricane):
Damage to agriculture - $10.7 million

Extreme Rain Events (2011) (Storm not Hurricane):
Infrastructure damage - $100 million

27. The SPCR economic analysis has indicated that:

"*to reduce climate risks and vulnerabilities while at the same time addressing socio-economic development concerns require active participation by government to build national capacity to implement climate change adaptation measures*".

"*The level of uncertainty relating to climate impacts together with the current threat faced and experienced by Dominica require the strengthening of the institutional and technical capacities for climate response and to ensure the promotion sustainable and viable investments*."

"*This study shows that the proposed SPCR investments are cost effective, meets the criteria to reduce climate risks and vulnerabilities while at the same time make a positive contribution to the sustainable growth and development of the Dominican economy*."

VII. Synergies/Linkages - National and Regional Track PPCR

28. The Regional SPCR has identified the following key challenges related to vulnerability to climate change in the Caribbean region:

(a) continued deficit of climate related baseline data to enable effective risk and hazard analysis and planning for resilience through adaptation to climate change;
(b) gaps in the regional climate monitoring system and unclear protocols for the exchange of and continued access to climate relevant data between and among national and regional agencies and users;
(c) a need to downscale global models of climate change impacts to better determine how Caribbean states would be affected and so facilitate the costing of impacts, inform planning and decision-making process;

(d) a need to better understand climate change implications for priority sectors such as agriculture, fisheries, health and water, as well as the adaptation options applicable to these sectors.

29. Base on these gaps/needs the areas of intervention of the Regional SPCR are (i) data availability and analysis; (ii) data exchange, storage and access; (iii) modeling climate change and impacts and (iv) identifying, up-scaling and replicating adaptation measures in key sectors. These will be addressed through the following components:

(a) Component 1: Improving Geophysical Data and Management for Adaptation Planning and Sea Level Rise and Storm Surge Impact Analysis;

(b) Component 2: Consolidating and Expanding the Regional Climate Monitoring Network and Global Platform Linkages;

(c) Component 3: Downscaling and Expanding Climate Projection Models and High Resolution Maps;

(d) Component 4 - Applied Adaptation Initiatives.

30. Dominica has already benefited from linkages/synergies between the national/regional track during Phase 1 PPCR implementation, namely;

(a) obtaining from the CCCCC the *Risk Management Guidelines for Climate Change Adaptation Decision Making* that guided Dominica`s SPCR ***climate change risk assessments***;

(b) the ***Cost-benefit Analysis*** of proposed SPCR investment opportunities was undertaken with technical support/methodologies provided by the Caribbean Community Climate Change Center (CCCCC) under Phase 1 of the regional track SPCR program, and the CCCCC Chief Economist provided a review of the draft SPCR Cost Benefit Analysis;

(c) CCCCC and UWI technical input into the design of Dominica`s SPCR provided during the SPCR Second Joint Mission.

31. It is foreseen that Phase 2 implementation of the national and regional track SPCR programs will be mutually supportive during the implementing of the following activities:

Dominica's SPCR	Regional SPCR
Component 1 – i. Inventory of surface and ground water resources, water balance assessment, continued monitoring of water resources, ***hydro-met and coastal monitoring stations*** (including for hydro-met and coastal monitoring equipment). ii. Development of ***Land Use Capability, Integrated Natural Resource Management Plan*** and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB).	Component 1 – i. Collection and generation of coastal topographic and bathymetric data, aerial imagery and DEM for select areas. ii. Data gap analysis to identify and prioritize other types of data acquisition. iii. Training in GIS and data management in participating PPCR pilot countries. iv. Integrated work with land use planners and coastal zone managers. v. Sharing of information and lessons learned with other PPCR and non-PPCR participating Caribbean countries.

Component 3 – i. Community vulnerability mapping and adaptation planning for all Dominica (based on pilot process developed under SLM) which is integrated into National Physical Development Plan being developed with support from CDB. ii. Establishment of community early warning systems based on real-time hydro-met data.	Component 2 – i. Support for regional connectivity and data interpretation and use for the existing hydro-meteorological networks region wide; ii. Consolidation of archiving and interpretation center and support for open connectivity to all countries and parties in the region; iii. Consolidation and expansion of regional archiving center and back up site outside the region iv. Consolidation of coastal topography and bathymetry data; v. Expansion of region's linkage and connectivity with GCOS, GLOSS and GOOS. Component 3 – i. Utilize climate data projections and tier 1 modeling outputs to generate framework for tier 2 (sectoral) modeling that would support improved adaptation planning and decision making and incorporation of climate change considerations into Agriculture, Water, Health, Forest/Ecosystems, Integrated Coastal Zone/Coastal Area Management and Land Use Planning. ii. Hazard maps showing projected sea level rise; hurricane intensity; precipitation: trends, distribution, high intensity events; and, Coastal (geomorphological) processes iii. Coastal Zone/Coastal Area Management Plans; Land Use Plans with corresponding policies and regulation; iv. Document and disseminate lessons learned; v. Capacity building: Training in ICZM and land use planning and management.
Dominica's SPCR	**Regional SPCR**
Component 1 - i. Food security program - design and construction of a pilot rain-fed organic greenhouse, and organic food processing/storage facility utilising renewable energy sources to determine technical and financial viability. ii. Food security program - pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability with a view to replicating in other vulnerable coral reef areas. Component 2 – i. financing key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under **Dominica`s Low Carbon Climate Resilient Development Strategy**;	Component 4- i. Enable the assessment, design, up-scaling and replication of practical adaptation measures; ii. Develop appropriate incentive regimes to encourage the implementation of adaptation measures by the private sector; iii. Document and disseminate good practices and lessons learned; iv. Scale up proved adaptation measures through the design and implementation of financial and regulatory instruments, including for rainwater harvesting, agriculture resilience practices. v. Assess and design of adaptation measures with preliminary feasibility analysis on, inter-alia, Dengue surveillance system, water aggregation/augmentation, coastal fishing. vi. Assessment of policy and legislative framework and determination of

ii. Establish micro-finance and micro-insurance for farmers, fisherfolk and vulnerable communities, in particular the Kalinago people and women (40% of funding to be reserved for women, 10% for Kalinago, and 10% for organic farmers). iii. Establishment of climate change adaptation standards (Private Sector). Component 3 – i. Community vulnerability mapping and adaptation planning for all Dominica (based on pilot process developed under SLM) which is integrated into National Physical Development Plan being developed with support from CDB. ii. Capacity Building/training program in Ministry of Public Works to climate proof the design, construction and operation of critical infrastructure including roads + Climate proofing of critical infrastructure.	enhancements to enable climate change adaptation; vii. Documentation and dissemination of lessons learned; viii. Design and delivery of training modules on successful adaptation activities and approaches, including gender and vulnerable groups.

32. It is anticipated that Dominica will obtain technical support from key regional agencies to implement national track SPCR activities which have close linkages with regional track SPCR activities as outlined above. Detailed project preparation activities for Dominica's SPCR will be undertaken in close collaboration with project preparation activities under the Regional SPCR to ensure harmonization of scheduling and timing of technical inputs. Dominica will be the country focal point for Component 2 of the regional track of the Caribbean PPCR.

VIII. IMPLEMENTATION ARRANGEMENTS

33. Dominica's SPCR is to be implemented over a 5 year period (2013 – 2018). SPCR implementation arrangements are outlined in Section 10 of **Dominica's *Low-Carbon Climate-Resilient Development Strategy.*** The Implementing Agency for the SPCR in Dominica will be the World Bank. The Council for Environment, Climate Change and Development (CECCD) and the Division for Environment, Climate Change and Development (DECCD) (formerly the ECU) that are to be legally established under the proposed *Environment, Climate Change and Development Bill* (which is being developed through broad-based consultation and is to be presented for enactment before the end of 2012) will be responsible for coordinating climate change programming in Dominica. It is proposed that the *Environment, Climate Change and Development Bill* be enacted prior to SPCR commencement as a demonstration of Government of Dominica's commitment to the establishment of the enabling framework to mainstream climate change into national planning processes.

34. The Ministry of Finance together with the ECU (to become the DECCD) will be responsible for overall coordination of SPCR implementation across Government, and for overall SPCR program monitoring and oversight. DECCD will report to the CECCD to provide regular reports on SPCR implementation and administration. The specific project management arrangements will be finalized during project preparation phase. The SPCR Technical Working

Groups (TWGs) will provide technical input during SPCR implementation from other ministries at the working level, and from the private sector and civil society.

35. In light of UN agencies long history and suport for climate change and environmental management capacity building in Dominica (including the INC, SNC, NBSAP, NCSA, Organic Dominica project, POPs project, Biosafety project, SLM project) and their competative advantage in this area, it is proposed that capacity building activities under the SPCR (Component 2) be executed by the United Nations Development Programme (UNDP) offices in Barbados through their OECS Environment and Sustainable Development Unit. The proposed operational and financial modality for this arrangement is to be further explored and finalized during detailed project preparation. With potential for considerable regional benefit, replication, and scalling up, Component 2 (vii) (*Establishment of Climate Change Adaptation Standards for the Private Sector*) will be implemented in close collaboration with the CCCCC.

36. Given the very substantial volume of adaptation investments proposed and the additional institutional capacity required to undertake climate change programming, implementation capacity will be closely monitored and assessed periodically throughout SPCR implementation. An assessment of capacity to effectively implement SPCR (and other climate change programming) will be undertaken during the mid-term review of SPCR implementation. This assessment will also verify the adequacy and sustainability of the legal, institutional and financing mechanisms that have been established to implement timely and effective climate change programming in Dominica. The Government of Dominica is committed to providing the necessary resources to ensure the timely and successful implementation of the ***Low-Carbon Climate-Resilient Development Strategy*** and compendium SPCR, which have been endorsed by the Hon. Roosevelt Skerrit - Prime Minister and Minister for Finance (letter of endorsement as of 5th April 2012) and approved by Cabinet on Tuesday 11th April, 2012.

37. Close institutional coordination and collaboration among relevant development agencies will be an ongoing process to explore and ensure synergies between SPCR and relevant activities during project design, preparation and implementation phases. Additionally, the Government of the Commonwealth of Dominica is committed to continue the close collaboration and engagement with the key stakeholders and civil society that was a key part of the SPCR planning process and consultations during the PPCR National Consultative Workshop and Second Joint Mission.

38. SPCR implementation activities will be documented – on SPCR websites maintained by Government of Dominica and CCCCC – for dissemination of best practices and lessons learned to other CARICOM countries, participating PPCR countries, and SIDS. The Government of Dominica will provide periodic reports to the CIF, and also sharing lessons learned with other countries through some CIF instruments such as the CIFNet website, through pilot country meetings, and through regular engagement with other CARICOM countries under the regional track SPCR program. Dominica will also share lessons internally learned during SPCR implementation through periodic workshops and focus group meetings with key stakeholders to take stock of progress.

IX. Role of World Bank

39. The World Bank was requested by the Government of Dominica to take the lead role in supporting the development of Dominica's SPCR. In so doing, the World Bank has built on existing collaboration on climate resilience building in Dominica, including as implementing agency for the GEF-funded CPACC, MACC, SPACC projects.

40. The World Bank will be responsible for the overall implementation of Dominica's SPCR to its Board and to the CIF. The World Bank will establish internal coordination arrangements for its implementation responsibilities.

X. Roles of other donors and international agencies

41. Following on from the success of the International Development Partners Meeting that was convened concurrently with the PPCR Second Joint Mission, donors and international agencies will continue to be consulted during Dominica's SPCR implementation to ensure alignment with existing and planned donor programs, and incorporation of lessons learned to future climate change programs being developed for Dominica and the region. Organizations consulted during development of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** and the SPCR will continue to be engaged during day-to-day discussions on the implementation of specific program components and through existing consultative mechanisms.

XI. Monitoring Framework: Impact, Outcome, and Outputs

42. The Project's Preliminary Design and Monitoring Framework (DMF) is attached as *Annex 9*. This is a strategic framework that summarizes the expected impact, outcome and outputs of the Project at an overarching level. Detailed monitoring frameworks for each component will be further developed during the detailed implementation stage of the Project.

Part III – Request for Project Preparation Funding

43. The SPCR proposes a comprehensive package of technical assistance and capacity building activities to be financed under the PPCR. The request for project preparation grant is attached as *Annex 10*.

Annex 1

List of Persons Consulted

NAME	ORGANIZATON	PHONE NUMBER(S)	EMAIL ADDRESS(ES)
Vernon Daniel	Agriculture Concepts and Consultancy	277 5640	agriculture.concepts@gmail.com; ibrahimdaniel@gmail.com
Mary Raffoul	ComeSeeTv	315 1111	krystallion@gmail.com
Adisa Trotter	Division of Agriculture	266 3804; 266 3805	aictudoa@gmail.com
Ricky Brumant	Division of Agriculture	614 1158	rebrumant@hotmail.com
Olu Obonyo	DOAM	277 8836	olu.obonyo@gmail.com; inquiry@doamdominica.org
Marshall Alexander	Dominica Meteorological Office	225 6995	marshallalexander@hotmail.com
Lolell Williams	Dominica National Council of Women	448 3935	williams_LOL@hotmail.com
Bristol Lawrence	Dominica Solid Waste Management Corporation	614 7501	lawrenceb.dswmc@cwdom.dm
Florian Mitchel	Dominica Solid Waste Management Corporation	616 8170	mitchelf.dswmc@cwdom.dm
Terry Raymond	Dominica Youth Environment Organisation Inc	614 7333; 245 3040	dyeoinc@gmail.com; tor70@cwdom.dm
Errol Harris	DOMSETCO	275 0724	errolmar@cwdom.dm
Magnus Williams	DOWASCO	275 1155	m.williams@dowasco.dm
Marie-Jose Edwards	Eclipse Inc.	235 2987	mariejose.edwards@gmail.com
Collin Guiste	Environmental Coordinating Unit	266 5256	ecu@dominica.gov.dm
Kimisha Thomas	Environmental Coordinating Unit	266 5256	ecu@dominica.gov.dm
Kongit Haile-Gabriel	Environmental Coordinating Unit	266 5256	ecu@dominica.gov.dm
Lloyd Pascal	Environmental Coordinating Unit	266 5256	ecu@dominica.gov.dm
Anthony Scotland	Environmental Health Department	266 3467; 266 3468	environhealth@dominica.gov.dm; scotlandmartina@hotmail.com
Harold Guiste	Fisheries	448 0140	fisheriesdivision@dominica.gov.dm
Ashton Lugay	Foresty Division	265 1458	lugaya@dominica.gov.dm
Agnes Esprit	GEF Small Grants Programme	245 6819; 440 4345	agnese@unops.org
Michael Savarin	Invest Dominica Authority	265 3027	msavarin@investdominica.dm

NAME	ORGANIZATON	PHONE NUMBER(S)	EMAIL ADDRESS(ES)
Marcus Lestrade	lands and Surveys Division	266 3435	landsandsurveys@cwdom.dm
Lovette Charles	Marigot Village Council	614 1683	lovette112@hotmail.com
Nichole Christian-Durand	Marpin 2k4	500 4164	nichole.durand@marpin2k4.com
Ted Serrant	Ministry of Education/ Local Lead GHG Emissions	245 7633	edplanu@yahoo.com
Hon. Dr. Kenneth Darroux	Ministry of Environment, Natural Resources, Physical Planning and Fisheries	266 3544	environment@dominica.gov.dm
Samuel Carrette	Ministry of Environment, Natural Resources, Physical Planning and Fisheries	266 3282	psagriculture@cwdom.dm
Emile B. Lancelot	Ministry of Public Works, Energy and Ports	275 0550	lancelot@dominica.gov.dm
Erickson Lewis	Ministry of Public Works, Energy and Ports	285 9224	erickson_dl@yahoo.com
Kendell Johnson	Ministry of Public Works, Energy and Ports	275 1442	johnsonk@dominica.gov.dm
F. O. Riviere	NANGO/ Save the Children	448 4872	foriviere@hotmail.com
Annie Edwards	Physical Planning Division	277 7568	annierose63@gmail.com
George de Romilly	PPCR International Consultant		romillyg@istar.ca
Bernard Nation	PPCR Team	275 3045	bnation@cwdom.dm
Oliver Grell	PPCR Team	276 6929	ogrells@gmail.com
McPerson St. Luce	S.I.S	245 8531	
Joe Petit	SAT Telecoms	449 5096	sat@sat.dm
George Maxwell	Tourism and Legal Affairs	266 3912; 266 3003; 266 3006	dgwmaxwell@gmail.com; dgwmaxwell@hotmail.com
Ronald Royer	Waitukubuli National Trail Project	285 3344	royee22@hotmail.com
Gerald Meier	World Bank	703 670 3115	gemintpan@aol.com; gmeier@worldbank.org
Justin Locke	World Bank	201 431 4209	jlocke@worldbank.org
Snorre Waage	World Bank	479 597 6861	swaage@worldbank.org
Farah Nibbs		295 5690	chinasa108@gmail.com

NAME	ORGANIZATION	PHONE NUMBER(S)	EMAIL ADDRESS(ES)
Delroy Williams	N.A.Y.A Inc.	615-5881	naya_da@hotmail.com
Agnes Esprit	GEF-SGP	440-4345/275-1275	gefsgpcompact@cwdom.dm agnese@unops
Michael Warrington	Agri Central Region	276-2023/615-7272	brmike03@hotmail.com
Magnus Williams	DOWASCO	275-1155	m.williams@dowasco.dm
Lolell Williams	Dominica National Council of Women	448-3935	williams_LOL@hotmail.com
Marshall Alexander	Dominica Met Service	225-6995	marshallalexander@hotmail.
Vernon Daniel	Agriculture Concepts & Consultancy	277-5640	agriculture.concepts@gmail.com ibrahimdaniel@gmail.com
Bristal Lawrence	Dominica Sewerage & Water Management Corp.	614-7561	lawrenceb.dswmc@cwdom.dm
Olu Obonyo	DOAM	277-8836	olu.obonyo@gmail.com inquiry@doamdominica.com
Snorre Waage	World Bank	479-597-6861	swage@worldbank.org
Gerald Meier	World Bank	703-670-3115	gemintpan@aol.com
Justin Locke	WB	202-431-4209	jlocke@worldbank.org
Ashton Lugay	Forestry	265-1458	lugaya@dominica.gov.dm
Henrietta Joseph	Ministry of Agriculture	614-6072/225-8504	
F.O. Riviere	NANGO/Save The Children	616-4872/448-2090	domniksave@cwdom.dm foriviere@hotmail.com
Josephine D. Prince	DNCW	448-3935	dncw@cwdom.dm joe8512@hotmail.com
George W. Maxwell	Tourism & Legal Affairs	266-3912/3003	dgwmaxwell@gmail.com
Bernard Nation	PPCR Team	275-3045	bnation@cwdom.dm
Oliver Grell	PPCR Team	276-6929	ogrells@gmail.com
Anthony M. Scotland	Environmental Health Department	266-3467/8	scotlandmartina@hotmail.com environhealth@dominica.gov.dm
Royston Daniel	Benjo's Seamoss	448-1650	
Elzina Jno. Baptiste	Mahaut Village Council	449-2520	
Kerry St. Hilaire	Campbell Village Council	449-0453	campbell.despor@gmail.com
Lindsay George	Worl;d Bank/ECU	440-5337/315-1111	krystallion@gmail.com

		265-2833/615-9465	
Jeremie Maxime	Bells Farmers' Group	612-7560	
Adisa Trotter	Agriculture Division	266-3804/5	aictudoa@gmail.com
K Johnson	Ministry of Public Works	266-3231/3026	johnsonk@dominica.gov.dm
Annie Edwards	Physical Planning Division	277-7568	annirose63@gmail.com
Atherton Martin	Sisserou Water Inc.	2761878	aem_75@hotmail.com
Michael Savarin	Invest Dominica Authority	265-3027	msavarin@investdominica.dm
Farah Nibbs		616-0431	chinasa108@gmail.com
Ricky Brumant	MOA	614-1158	rebrumant@hotmail.com

Persons Consulted during Second Joint Mission

Name	Organization	Phone Number(s)	Email Address(es)
Sharon Jones	CARDI	767 448 2715	sjones@cardi.org
Olu Obonyo	DOAM	767 265 8570	olu.obonyo@gmail.com; inquiry@doamdominica.org
Gregoire Thomas	DEXIA	767 448 2780; 448 3494	dexia@cwdom.dm; thomasg@cwdom.dm
Marie-Jose Edwards	Eclipse Inc.	767 235 2987	mariejose.edwards@gmail.com
Joseph Isaac	NECS- Min of Trade	767 277 0445	jisaac@necsdominica.com
Lindsey George	World Bank/ PPCR Team/ Krystallion Inc	767 265 2833	krystallion@gmail.com
Ronnie Gavengne	Ministry of Agriculture	767 225 0499	gavegne@yahoo.fr
Kent E. Copel	IICA	767 448 4502	iicadm@cwdom.dm
Ricky Brumant	Ministry of Agriculture	767 266 3810; 266 3812; 614 1158	brumantr@dominica.gov.dm; rebrumant@hotmail.com
Joyette Fabien	Social Services	767 266 3250	fabienhj@dominica.gov.dm
Tatsuya Morita	JICA	767 440 3184	Morita.Tatsuya@jica.go.jp
Magnus Williams	DOWASCO	767 275 1155	m.williams@dowasco.dm
Kathleen Pinard-Byrne	Dominica Red Cross	767 448 8280; 616 1300	directorgeneral@redcross.dm
Adisa Trotter	Ministry of Agriculture	767 266 3804	aictudoa@gmail.com
Marlene Attzs	UWI, St. Augustine	868 662 ext 83814	marlene.attzs@sta.uwi.edu
Eduardo Reyes	CfRN	011 507 667 32337	ereyes@rainforestcoalition.org

Minchinton Burton	Forestry and Wildlife Division	767 266 5852	forestry@dominica.gov.dm
Jerome Lavashire	Portsmouth Farmers Association	767 225 1076	lavaenterprise@yahoo.com
Reynold Murray	UNDP	246 467 6014	reynold.murray@undp.org
Jessica Canham	WEF	767 449 2342	jessica@earthbook.tv
Kamala JohnBaptiste-Aaron	Cutting Edge Communications	767 235 7391	cecommunications@gmail.com
Carleen Roberts	Office of the NAO	767 448 2424	edf@cwdom.dm
Laura Berman	Castalia	202 299 7800	laura.berman@castalia-advisors.com
Carolina Pena	OAS	758 719 5450	cpena@oas.org
Oliver Grell	PPCR Team	767 448 2258	ogrells@gmail.com
F. Osborne Riviere	Dominica Save the Children	767 448 2090; 616 4872	foriviere@hotmail.com; domniksave@cwdom.dm
Clement Rabess		767 446 1076	crabess@hotmail.com
Adenauer Douglas	Portsmouth Community Watch Foundation Inc and Arbeedee Ltd	767 235 5107	addoug@hotmail.com
Bernard Wiltshire	WEF	767 245 8598	54 King George V Street, Roseau
Roy Casey	Emerald	767 295 2063	Point Carib
Justin Locke	World Bank	202 431 4209	jlocke@worldbank.org
Snorre Waage	World Bank	202 650 8341	swaage@worldbank.org
Allison Davis	Caribbean Development Bank	246 431 1654	davisa@caribank.org
Charmaine Gomes	UN ECLAC	868 224 8024	charmaine.gomes@eclac.org
George De Romilly	ECU		
Sally Edwards	PAHO; WHO	246 434 5200	edwardss@paho.org
Michael Bejos	OAS	767 448 2620	mbejos@oas.org
Jose Viana	Brazilian Ambassador	767 616 7080	jose.viana@itamaraty.gov.br
Carmen Martinez	Venezuelan Ambassador	767 448 3348	grimar17@yahoo.com
Roland Royer	DBOS	767 225 3344	royee22@hotmail.com
Michael Eugene	Saving Waitukubuli	767 616 5827	jtas@cwdom.dm
Hillarian Jules	Housing Division	767 266 3762; 275 3931	julesh@dominica.gov.dm
Nicholas Bruno	Ministry of Nat. Sec, Labour and Imm	767 266 3354	brunon@dominica.gov.dm
Nathanael Isaac	Office of Disaster Management	767 448 7777; 448 3381; 275 1909	odmdominica@gmail.com; nathanaelisaac@hotmail.com
Gwennie Dickson	DOWASCO	767 255 2911	g.dickson@dowasco.dm

Lollel Williams	DNCW; Kalinago Community	767 448 4457	williams_LOL@hotmail.com
Celia Joseph	Ministry of Lands, Housing, Settlements and WRM	767 266 3413	josephce@dominica.gov.dm
Marshall Alexander	Dominica Met Services	767 225 6995; 449 1990	marshallalexander@hotmail.com
Jacinta David	NECS- Min of Trade	767 265 6408	jdavid@necsdominica.com
Craig Stedman	NECS- Min of Trade	767 277 4474	cstedman@necsdominica.com
Ted Serrant	Min of Education	767 266 5560	edplanu@yahoo.com
Natalia Pacquette-Anselm	NECS/ DEXIA	767 440 6693; 448 2780	npanselm@necsdominica.com
Hilda Kelshall	NECS/ DEXIA	768 440 6693; 448 2780	hkelshall@necsdominica.com
Jahna Mc Lawrence	NECS	767 275 4229; 440 6693	jmclawrence@necsdominica.com
Lolita Raffoul	Discover Dominica Authority	767 448 2045	lraffoul@dominica.dm
Ronald Charles	Forestry and Wildlife Division	767 266 5852	charlesrf@dominica.gov.dm
Michael Savarin	Invest Dominica Authority	767 448 2045	msavarin@investdominica.dm
Kim Eli-McMillan	Parry W. Bellot & Co. Ltd. – Agro Processor	767 448 2860	bellohradmin@cwdom.dm
Ashton Lugay	Forestry and Wildlife Division	767 266 5857	lugaya@dominica.gov.dm
Bernard Nation	PPCR Team	767 440 7777	enviroplus@cwdom.dm
Riosamund Edwards	Ministry of Finance	767 266 3221	edwardsr@dominica.gov.dm
Ian A. Lambert	PW Bellot & Co. Ltd	767 245 9382	ianmar5757@yahoo.com
Atherton Martin	Sisserou Water Inc.	767 276 1878	aem_75@hotmail.com
Annie Edwards	Physical Planning Divivsion	767 277 7568	annierose63@gmail.com
Adriana Valencia	IDB		adrianava@iadb.org
Henry Shillingford	HMS Law Chambers	767 440 8257	hmslawchambers@gmail.com
Sara Valero	IDB		sarav@iadb.org
Eisenhauer Douglas	Ministry of Employment, Trade, Industry and Diaspora Affairs	767 266 3911	salguo2004@yahoo.com
Patricia Mendoza	Caribbean Regional PPCR Coordinator		patriciab.mendoza@gmail.com
Joel Branski	IDB Country Representative, Barbados		
Christiaan Gischler	IDB, Energy Senior Specialist		

Annex 2

Climate Change Risk Assessment

See Risk Assessments contained in report on SPCR National Consultative Workshop at http://krystallion.com/ppcrdom/

Annex 3

National Adaptive Capacity Assessment undertaken during the PPCR planning process

Based upon the results of the ***Community/Sectoral Adaptive Capacity Assessment*** undertaken by each of the Technical Working Groups will undertake a ***National Adaptive Capacity Assessment***. This assessment will evaluate progress achieved in implementing a stage-by-stage process towards adaptation planning and management as recommended during the First Meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) (COP-1, Berlin, 1995), where the decision was taken[9] to approach adaptation in three stages:

- **STAGE 1 – *Planning for adaptation***, which includes studies of possible impacts of climate change, to identify specific vulnerable regions or communities and policy options for adaptation and appropriate capacity building;
- **STAGE 2 – *Measures to prepare for adaptation***, including further ***capacity building;***
- **STAGE 3 - *Measures to facilitate adequate adaptation***, including insurance.

This phased approach, which systematically builds national capacity through strategic interventions thereby ensuring country-ownership and long-term sustainability, is proposed as the basis for evaluating adaptive capacity in Dominica.

Stage I: Planning, which includes studies of possible impacts of climate change, to identify particularly vulnerable countries or regions and policy options for adaptation and appropriate capacity-building. Such Stage I adaptation activities will[10], amongst other matters, identify options to facilitate adequate adaptation to climate change. These activities could encompass the following:

Capacity Building Activities	Status
i. *Sensitisation and building awareness* of climate change impacts and risks at national and local levels and within vulnerable sectors and population groups, including awareness on economic costs of climate change impacts;	The Environmental Coordinating Unit has over the past years has as its core activity "sensitisation and building awareness". This is an ongoing activity.
Ii *Building climate monitoring and analytical capacity*, including climate	One *of the activity undertaken during the development of Dominica's SNC was "Dominica*

9 UNFCCC - Decision 11/CP.1 - *Initial Guidance on Policies, Programme Priorities and Eligibility Criteria to the Operating Entity or Entities of the Financial Mechanism*

10 GEF Operational Strategy on Climate Change

modeling and climate data/records;	*climate trends and projections".* *There is a critical need to improve on work done once the datasets are available.*
iii. *Building adaptation planning capacity* at national and local levels and within vulnerable sectors and vulnerable population groups, initially by facilitating the creation of climate change coordinating mechanism (climate change focal point, climate change committee) which is afforded political power by being attached to a senior political office or powerful ministry of government, stakeholder analysis of existing policies and strategies that may be affected by climate change impacts, and evaluation of functions and risks management capacities of institutions and organisations (at national and local levels), and identifying and prioritising opportunities for addressing identified climate change risks;	Dominica policy on adaptation planning to climate change was approved by Cabinet in 2002. This document spells out critical sectoral adaptation strategies. The ECU and climate change focal point was established. NCCC is operative and has representation of a wide cross-sector, including public, private, NGO, and local government.
iv. *Undertake a vulnerability and adaptation assessment* to identify general strengths and weaknesses of baseline conditions and specific needs and concerns, such as potential barriers to adaptation in critical areas or sectors, and opportunities and priorities for adaptation.	The recently completed SNC has V&A as one of its component. Critical sectors were prioritised, analysed and adaptive strategies developed. For this report the assessment utilized a modified version of the Adaptation Policy Framework (APF), developed by the United Nations Development Programme (UNDP) as a tool for climate change impact and adaptation assessment. The APF emphasizes five major principles: 1. Adaptation policies and measures are to be assessed in a developmental context (i.e. they should be complementary to and/or

	consistent with wider sustainable development efforts such as poverty reduction, environmental protection, economic growth); 2. Adaptation to short term climate variability and extreme events are explicitly included as a step towards reducing vulnerability to long term climate change; 3. The Adaptation strategy and the process by which it is achieved are equally important; 4. Adaptation occurs at various levels within the society including at the local level; 5. An essential element of response to future climate change is building of capacity to deal with current climate
v. *Assessment of national, regional and/or subregional vulnerability* to climate change, where appropriate, rely on related data-gathering systems to measure climate change effects in particularly vulnerable countries or regions and strengthen such systems as necessary, and identify a near-term research and development agenda to understand sensitivity to climate change.	Research and Systematic Observation, as sub-component of the V&A within the SNC was developed. This report critically analysed related data gathering systems nationally. Recommendations for improvement was amplified.
vi. *Evaluation and assessment of policy frameworks for implementing adaptation measures* and response strategies in the context of disaster preparedness, agriculture, fisheries, health, economic development and forestry, with a view of integrating climate change impact information, as appropriate, into national strategic planning processes.	The exercise was undertaken during the development of V&A for the priority sectors. Under CPACC an issue paper was developed which outlined the legal and policy institutional framework for adaptation which led to the development of Dominica's adaptation policy. Under the NCSA a comprehensive review of the legal and policy framework was undertaken.
vii. *Develop, in a participatory manner, climate change adaptation strategy* (or Nation Adaptation Plan of Action - NAPA) which identifies priority approaches, methods and	The policy on adaptation planning was developed through a participatory process and adopted by Cabinet in 2002.

tools for adaptation, and prioritises institutional capacity building requirements at the national, local and municipal levels and within vulnerable sectors.	
2. ***Stage II: Measures to Prepare for Adaptation***, including further ***capacity-building*** which may be taken to prepare for adaptation[11], and measures that promote cooperation in preparing for adaptation to the impacts of climate change. These activities could encompass the following:	
i. *Establish capacity building measures to support adaptation planning at national level* (as outlined in national adaptation strategy or policy), including -	Yes/No
a. the integration of climate change risk into the environmental impact assessment process;	No
b. Integration of risk assessment and management in the design of infrastructure projects;	No
c. Integration of risk assessment and management in the urban planning process whereby vulnerable areas are spatially identified, and adequate risk management measures established through byelaws, zoning, setbacks, covenants, building restrictions;	No
d. evaluation of engineering design criteria and building codes to ensure adequately reflect climate change projections in regards to loadings, tolerances and return periods;	No
e. integration of climate change risk assessment and adaptation management in financial and insurance sector;	No

[11] As envisaged by Article 4.1(e) of the Convention.

f. integration of climate change risk and adaptation into formal and informal education programs;	No
g. develop and elaborate appropriate and integrated plans for water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification, as well as floods;	DOWASCO has started to incorporate these concerns within its integrated plans for water resources. Re agriculture, the Division is now giving some consideration to measure - (CWA).
h. integration of climate change risk assessment and adaptation management into sectoral policies and programs, and national development strategies (e.g. sustainable development, water resource management, disaster management, biodiversity conservation, health, education, and coastal protection).	No – this has been recommended within the SNC and other policy statements made by the Ministry of Environment, Natural Resources, Physical Planning & Fisheries. Climate change adaptation issues have been identified in Dominica NBSAP.
ii. *Establish capacity building measures to support adaptation planning measures at local and community level*, including development of climate information and decision-making tools (vulnerability atlases, community-level risk management strategy).	Activity undertaken in 10 pilot communities under the SLM process.
iii. *Establish capacity building measures to support adaptation risk assessment and management measures within vulnerable sectors*, including financial sector (banks and insurance industry), agricultural sector –	No
a. Build and strengthen formal & informal research and adaptation management networks;	No
b. Tool development to identify impacts & adaptation options	No
b. Disseminate and train on use of guides/tools for vulnerability assessment and adaptation	No

management.	
iv. *Establish capacity building measures to support risk management and adaptation planning measures within vulnerable population groups*, including vulnerable communities, farmers, women, youth, elderly.	No
3. ***Stage III: Measures to Facilitate Adequate Adaptation***, including insurance, and other adaptation measures[12]. 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. These activities could encompass the following:	
i. Mainstreaming of climate change adaptation that results in the shift of responsibility for climate change adaptation from single ministries or agencies to all sectors of government, civil society and the private sector – guided by national multi-stakeholder committee/council.	No, although efforts, recommendations made specifically after completion of the MACC Project. The NCSA also looked at improving coordination but recommendations have not yet been implemented.
ii. *climate change risk assessments being undertaken* for all new infrastructure projects, and risk management measures incorporated into design and operation of infrastructure projects.	No
i. *assimilation of adaptation activities within development budgets* (at national, local and municipal levels) to ensure that these interventions continue to be properly funded over the long term, integrated into relevant sector priorities and balanced against other competing priorities.	No
ii. *climate change risk assessment and management a formal part of urban planning* processes and vulnerability atlases developed and used to inform urban growth.	No
iii. *climate change relevant engineering design criteria and building codes* used for infrastructure design and construction.	No

[12] As envisaged by Article 4.1(b) and 4.4 of the Convention.

iv.	*lending and insurance programs have adequate risk management measures in place* (e.g. site vulnerability assessments as part of loan process, re-insurance schemes established to cover catastrophic loss from extreme events, etc.).	No
v.	*climate change risk and adaptation a formal part of the education curricula* in formal education and profession education programs.	No
vi.	*vulnerability atlases used as part of early warning systems for disaster management* at national, local and community levels.	No
vii.	*health service delivery made resilient* to stressors caused by climate change impacts and *population made more resilient to climate change health impacts*.	No
viii.	*undertake monitoring and evaluation*, and amend ongoing adaptation measures, policies and programs as necessary.	Although being an activity undertaken during the development of the SNC, it is anticipated that this will be core of future activities if climate change resilience is to be achieved. One sea level rise monitoring station is operational.

Annex 4

SPCR Household and Community Survey

http://www.worldbank.org/ibrd

Building Climate Resilience in Vulnerable Communities

Introduction: Based on recommendations of an independent Expert Group, Dominica has been selected as one of the countries to participate in the Pilot Program for Climate Resilience (PPCR) which is part of the Strategic Climate Fund (SCF), a multi-donor Trust Fund within the Climate Investment Funds (CIF). The goal of the Pilot Program for Climate Resilience (PPCR) is to help countries transform to a climate resilient development path, consistent with national poverty reduction and sustainable development goals.

This survey to evaluate and map household vulnerability to climate change impacts is being undertaken as part of the process to develop the Pilot Program for Climate Resilience (PPCR) in Dominica with support provided by the World Bank. The survey will provide information that will assist in developing and implementing priority risk management measures that will help individual households and vulnerable communities respond to climate change risks, including the following:

- ***an anticipated 50cm rise in sea-level, which when combined with storm surge will result in coastal areas being inundated;***
- ***increase in extreme events (droughts, flooding);***
- ***increase in hurricane intensity (i.e. more category 4 and 5 cyclones);***
- ***changes in weather patterns;***
- ***increased episodes of high temperatures.***

Questionnaire Administrator…….

Questionnaire completed by: ……..

Date:___/___/2011 House location:_____ (give map reference)

Household Questions

1. Name of Informant(s): _____

2. Number of Occupants:_____

3. Household data (start with eldest)

Name	Gender (M, F)	Age: 60+, 16-60. 5-15 Up to 5	Occupation

4. How many years have you lived in this community? _____ Years or Whole Life □

Questions about buildings/house - Do you own or rent the house? _____

5. Age of building/structure (years) _____

6. Current condition of building and roof

	Tick box and condition of the house and roof			
	Excellent	Good	Fair	Bad
Roof Condition				
Building Condition				

7. Prone to Flooding Yes □ No □

8. Is the house raised above ground?
   Yes □ No □

9. Approx how many meters above the ground is it raised? …… (m)

10. What method has been used to raise the house above the ground: (tick box)
    Piles □

    Raised foundation □

Other Methods. □

Describe:……
……

11. What is the house made of:

Building	Tick box and indicate % of materials used in the construction							
	Concrete %	Concrete Block %	Wood %	Plywood %	Metal or Tin %	Thatch %	Coral/ Lime%	Others %
Roof Type								
Outside Walls								
Main Dwelling (inside walls, ceiling etc.)								
Floor/Foundation Type								

12. Quality of Construction

	Tick box and indicate how structure was built			
	Professional	Amateur	Informal	Other

Does Roof have Cyclone Ties				
	Yes		No	

13. Number of Rooms _____

14. Size of main building (dwelling): _____m x _____m

15. Estimated value of the main building: $_____

16. Is your house (building) insured? $_____

17. Size of other buildings on land: 1. _____m x _____m
2. _____m x _____m

18. Use of other buildings on land: 1. _____
2. _____

19. Value of other buildings on land: 1. $_____
2. $_____

Questions about Food and Agriculture

20. What are your main foods (list) ?
_____
_____
_____

21. What Percentage are imported foods _____ or purchased locally _____ or grown by yourself_____. List foods grown by yourself
_____

22. Have you ever had a food shortage or shortage of certain types of food?

23. Fill in the table below the required data for the three most recent food shortages

	Shortage 1	Shortage 2	Shortage 3
Date (Month and Year)			

Caused by e.g. no ship, cyclone destroyed crops			
Length of shortage			
Type of food that was in short supply			
Action taken to deal with shortage			

24. Do you preserve any foods? Yes □ No □

25. If yes, what foods (list)?

_____

26. Describe how do you preserve them (e.g. traditional, modern, drying, salting, recovery and preserving before and after cyclone damage to crop)?

_____

27. Questions about Food Storage/stocks (Imported or produced locally)

Food Storage	%	Number of appliances
Refrigerator		
Freezer		
Dried/Canned		N/A
Other		N/A

28. Questions about Food Preparation

Main Cooking Fuel	%
Firewood	
Gas	
Electric	
Other	

29. Questions about Farming and Livestock

Farming Agriculture type	%
Subsistence/Domestic	
Commercial	
Other	
Crops: (List)	
None	

Livestock Activity	Est. Number
Poultry	
Piggery	
Goat	
Other	

30. Value of farm (if applicable): $_____

31. Where is your growing activity Close to Household □ Away from Household □

32. Where is your Livestock activity Close to Household □ Away from Household □

Questions about Water Supply

33. Do you have piped water? Yes □ No □

34. Do you have a water tank(s)? Yes □ No □

35. If yes, what material is it made from

Plastic	Metal	Concrete	Other (specify)

36. What size is the water storage tank (in litres)?_____
Is it is good working condition? Yes □ No □

37. Does your roof catch rain? Yes □ No □

38. If yes, how extensive is the guttering to catch the rain?

(a) All around the house □
(b) Half of the house □
(c) A single spout (guttering-piece) □
(d) Pump from tank to house □

39. Main source of Drinking Water

Tick box and indicate water source						
Public System Only	Community System Only	Public and Community	Bottled	Catchments, Tanks, Drums	Well/ Borehole	Springs

40. What actions do you take to cope with water shortages?

_____

_____

41. Do you reuse any water e.g. from washing machine, shower, cooking etc? Yes □ No □

42. If yes, what do you use this water for? _____

43. Questions about Energy Use

1. **Energy Source**	%
Mains connected	
Own Generator	
Other Power Source (Type _____)	
None	

44. Do you have water heating (tick box)?

Solar	Gas	Electric	None

45. Does your house have natural ventilation and/or shade on the north side?

Yes □ No □

46. Do you have air conditioning or fans for cooling the house? Yes □ No □

Questions about Waste

47. What type of toilet (s) do you have

Type	How many	Location In/out
Pour flush		
Flush		
Long drop		
Composting		
Sea disposal		

48. What happens to wastewater?

Tick box and indicate what happens to waste water				
Waste Water Disposal	Septic Tank	Open	Waste Treatment System (Type)	None

49. Do you have separate soak pit for graywater? Yes □ No □

50. How do you get rid of your rubbish?

Waste Disposal	%
Hole	
Collected	
Open Burning	
Other	

Questions about Storm Surges and Rain Floods

51. Fill in the table below the required data for the three most recent floods

	Flood 1	Flood 2	Flood 3
Date (Month and Year)			
Caused by e.g. cyclone rain, cyclone waves,			
Flood water depth in house (M)			
Depth on compound (M)			

Spatial extent of floods (Mark on map. Use separate maps for different floods)			
Intensity in terms of damage			
Duration of flood in the main house (Minutes or Hours)			
Damage to building structure or electrical system ($)			
Damage to building contents ($)			
Damage to crops ($)			
Damage to livestock ($)			
Damage to other possessions e.g. cars ($)			

52. What actions have been taken by the household to prevent flooding?
    1. ……..…
    2……..……
    3…….
    4…….
    5…….

53. Have you ever considered moving your house to a place less vulnerable to flooding or building up on pillars?
    Yes □ No □

    If yes, why have you not moved or bullt up on pillars? ……

54. If yes and have moved, where is this place i.e. location? Mark location on map and describe
……..……

Questions about Climate and Vegetation

55. Do you think the climate has changed over time? Yes □ No □
If yes, what changes have you noticed?

_____

_____

56. What do you think caused these changes?

_____

_____

57. Has the vegetation changed over time? Yes □ No □
If yes, is it more vegetated now than 10 or 20 years back?_____

58. Have there been bush fires in your area Yes □ No □
If yes, what was the main cause of these fires?_____

Questions about Shoreline Changes

59. How has the shoreline, lagoon or coral reef changed over the years?
……
……
……
……
……

60. What caused these changes?
……
……
……
……

61. Have you noticed any changes to your livelihood after changes to the shoreline, lagoon or coral reef? What have been these changes?

……
……
……

Questions about Health and Climate Change

62. Do you have any areas of standing water (e.g. plastic or metal containers that collect water, broken or blocked drainpipes, unused boats) around your house?

Yes □ No □

63. Does anyone in your house suffer from asthma or other respiratory ailments?

Yes □ No □

64. Has anyone in your house ever suffered from dengue fever or malaria?

Yes □ No □

65. Do you have anyone in your house that is infirm or needs assistance to undertake daily chores? Yes □ No □

Annex 5

Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development

Objectives
Build climate resilient communities by strengthening capacity to address climate change risks to food security principally from changing precipitation patterns.

Outputs/Outcomes
Key outcomes include:
(a) Information, tools and capacity to facilitate effective management of vulnerable water resources;
(b) Information, tools and capacity to facilitate effective physical planning and management of vulnerable resources;
(c) Pilot measures to improve food security in vulnerable communities to be replicated under Adaptation Fund.

Activities
As highlighted I Section 3.5 of Dominica's **Low Carbon Climate Resilient Development Strategy,** for a country that could be self sufficient and provide food to neighbouring countries, Dominica food imports constitute an increasing burden on the economy, and threatens food security. Impacts from climate change, affecting agricultural productivity, continue to aggravate this situation. Component 1 will support the following activities:

(i) ***Water Resource Inventory*** (surface and ground water resources), water balance assessment, continued monitoring of water resources, establishment of automatic ***hydro-met and coastal monitoring stations*** (to be designed in collaboration with the establishment of hydro-met and coastal monitoring stations by CCCCC being supported in Caribbean countries under European Union Africa Caribbean Pacific (EU-ACP) project) to support establishment of community early-warning systems development (see Component 3 (ii) below) and ***Integrated Resource Management Plan*** (see sub-component ii) that will guide water conservation, extraction and use (see *Annex 6 (a)* for outline of draft legislation which will guide water resource use). The Integrated Resource Management Plan must be predicated on the application of an **Island Systems Management** (ISM) approach[13].

(ii) development of ***Land Capability Maps, Integrated Resource Management Plans*** and supporting legislation (as part of supporting mechanism for the Local Area Plans, National Land Use Policy and the National Physical Development Plan) to regulate development in coastal and watershed areas, prevent pollution and ensure quality, regulate the extraction,

[13] An island (terrestrial and juridical marine area) is viewed as a single coastal entity with a series of inter-related and inter-dependent ecological processes. These processes are impacted by resource-related anthropogenic events, but in order for resource use to be sustained, customised and carefully adapted planning, development and management strategies that are consistent with the complex interactions of an island system, must be employed. The diminutive size of small islands means that development and the physical environment are closely related and interdependent, necessitating an **Island Systems Management** approach to infrastructural and economic development.

conservation of water, and determine sustainable irrigation levels. A project being considered for financing by the CBD is intended to develop a *National Physical Development Plan* and a *National Land Use Policy* for Dominica which will guide development for the next 20 years. These documents will provide principal land use guidance as well as strategies to manage the impacts from climate change. SPCR support will complement the development of the National Physical Development Plan and National Land Use Policy by integrating the outcomes of the Water Resource Inventory undertaken under Component 1 (i) above and the ***Integrated Resource Management Plan*** into the Local Area Plans, *National Physical Development Plan* and a *National Land Use Policy* for Dominica. The formulation of the *National Physical Development Plan* and a *National Land Use Policy* for Dominica will also be informed and guided by community vulnerability atlases and adaptation plans formulated under Component 2 (iiii. (See see *Annex 6 (a)* for outline of draft legislation which will guide intergated coastal and water resource management). The Adaptation Fund is going to support the soil inventory and the vegetation inventory and the agricultural and food security plan that will be integrated into the ***Integrated Resource Management Plan***, the National Physical Development Plan and National Land Use Policy UNECLAC work will support the economic assessment of key sectors as part of the Physical Planning process. The development of **Land Use Capability,** and **Integrated Resource Management Plan** must be informed by the **Island Systems Management** approach. This suggests that the governance architecture for the management of land and marine resources must be informed by:

- the risks imposed by the impacts of climate change and climate variability on current and planned land uses;
- an integrated resource management programme that would ensure the equitable allocation/distribution of land resources across sectors to support current and future demands;
- the deployment of adaptation strategies that will rationalize the use of land resources with corresponding enforcement strategies.
- creation of a Data Repository and Clearing House so that geo-physical information can be made accessible to all stakeholders. – to be linked to the GeoNode being supported by the World Bank.

(iii) Establishment of ***food security program*** (to be scaled up and replicated with support under Adaptation Fund) involving:

1. design and construction of a pilot rain-fed organic greenhouse, drip irrigation and organic food processing/storage facility utilizing renewable energy sources to demonstrate technical and financial viability with a view to replicating in other vulnerable communities;
2. community-based pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability in Dominica with a view to establishing nurseries of climate resilient coral species in vulnerable areas. This pilot activity will be undertaken in collaboration with the CCCCC which has successfully demonstrated coral restocking in Belize and Jamaica with support from the World Bank.

Annex 6

Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing

Objectives
Establish the enabling framework and sustainable financing for climate change risk management at the national level and in the private sector.

Outputs/Outcomes
Key outcomes include:
(a) improved coordination and implementation of climate change mainstreaming activities through the legal establishment and strengthening of the Division of Environment, Climate Change and Development (DECCD);
(b) improved access to financing for priority climate change risks management measures by private sector and vulnerable communities;
(c) climate change risk management integrated into the business operations of the private sector through regular auditing, monitoring, and improvement.

Activities
Component 2 will support the following capacity building activities:
(i) financing key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under **Dominica`s Low Carbon Climate Resilient Development Strategy**. The SPCR technical personnel will compliment staffing of the Division of Environment, Climate Change and Development (DECCD) that is to be legally established under the proposed Environment, Climate Change and Development Bill (see Annex 6 (a) for outline of draft legislation which is currently undergoing public consultation with support under the SLM project in accordance with Cabinet Decision dated the 23rd August 2012) which is to be presented for enactment before the end of 2012. It is proposed that the Environment, Climate Change and Development Bill be enacted prior to SPCR commencement as a demonstration of Government of Dominica's commitment to the establishment of the enabling framework to mainstream climate change into national planning processes. Managing climate change programming is an additional responsibility of the ECU (DECCD), the incremental cost of which – in keeping with agreements under the UNFCCC - should not be a cost borne by resource-stretched developing countries but rather by those industrialized national that have been principally responsible for global climate change. It is anticipated that the Government of Dominica - once the value of improved climate change programming/coordination has been demonstrated during SPCR implementation - will mobilize the necessary resources to ensure continued funding for these positions. Within 3 years of SPCR commencement, the Government of Dominica will have identified and established funding sources (including possible support from the Climate Change Trust Fund established under Component 2 (iv) below) to sustain the operations of the DECCD once SPCR program has been completed.

(ii) design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels to be coordinated by the Division of Environment, Climate Change and Development (DECCD);

(iii) ***community vulnerability mapping and adaptation planning*** undertaken for Dominica (based on process piloted under SLM and SPACC projects) and ***integrated into Local Area Plans and National Physical Development Plan*** – see Component 1 (ii);

(iv) legal establishment of *Climate Change Trust Fund* in addition to US$1 million seed funding to the *Climate Change Trust Fund* to provide support to priority private sector and community climate change risks management measures the latter identified through community vulnerability mapping and adaptation planning (Component 2 (iii) above). The design and legal establishment of Dominica`s *Climate Change Trust Fund* will be informed by work being undertaken by UNDP to establish similar Trust Funds in other developing countries in Asia and the Pacific, and be guided by similar initiatives being undertaken with MDB/SPCR support in Papua New Guinea, Saint Lucia, Jamaica, Samoa, and Tonga, and initiatives being supported by the CCCCC in BVI. Special focus will be to ensure that Dominica`s *Climate Change Trust Fund* achieves the fiduciary management expectations of the international donor community and is self-sustaining after initial SPCR seed funding is provided. The Trust fund will support capacity building and provision of small grants to support climate-proofing of livelihoods related to fishing, farming, tourism and craft (based on the adaptation plan and business model approach being implemented by CARIBSAVE in the Climate Change Coastal Community Enterprises-Adaptation Resilience Knowledge (CCCCE-ARK) project funded by the IDB, Multilateral Investment Fund (MIF).

(v) establishment of micro-finance and micro-insurance for farmers, fisherfolk and vulnerable communities, in particular the Kalinago people and and other vulnerable groups (40% of funding to be reserved for women, 10% for Kalinago, 10% for youth, persons with disabilities and 10% for organic farmers). The micro-financing and micro insurance scheme will also be provided to the private sector to support climate resilience measures and investments.

(vi) establishment of climate change adaptation standards for the private sector – see detailed proposal attached as Annex 6 (b).

Annex 6 (a)

DOMINICA'S PROPOSED *ENVIRONMENT, CLIMATE CHANGE AND DEVELOPMENT BILL*

Public Consultation Paper

Overview

1. There have been a ***number of reviews of Dominica's environmental and resource management legislation over the past 15 years which have all come to the conclusion that comprehensive environmental and natural resource management legislation is an urgent priority*** in order to prevent irreversible environmental damage to the natural resources upon which Dominica relies for sustained economic and social development.

2. In Dominica ***over 105 pieces of legislation are used to manage differing aspects of the environment and are managed by many different ministries, statutory bodies or other agencies***. There is currently no overarching environmental legislation or single administrative body to oversee environmental matters. This is problematic for the various departments which deal with environmental use and management matters, as well as those involved in the enforcement of environmental laws.

3. Most of the laws are ***old and ineffective in a modern environmental management context*** or suffer from a lack of enforcement through inadequate staffing, lack of technical resources and funding, or through administrative failures.

4. Additionally, a number of 'draft' Acts have been developed in recent years ***but have not been enacted.***

5. The ***existing legislation is outdated -*** many of the Acts pre-date the signing of international environmental agreements by Dominica that enshrine new and evolving environmental principles/concepts such as sustainable use and the greater appreciation of the interconnectedness of environmental protection with other facets of development.

6. There is ***substantial gaps and overlap between existing legal mandates*** for natural resource management amongst various ministries with resultant confusion over jurisdiction roles – more particularly there is no legal basis to ensure:
   (a) ***functional co-ordination*** amongst various Departments/agencies to ensure sound and coordinated environmental protection and the sustainable management of finite resources for Dominica's long term benefit;

   (b) ***site specific co-ordination*** in the management of natural resources.

7. Save for a few pieces of legislation, present legislation ***does not meet Dominica's obligations under the 27 Multilateral Environmental Agreements (MEAs) to which the country is a***

signatory – most notably the agreements dealing with Climate Change, Pollutants and Hazardous Substances, Biodiversity, Biosafety.

8. Dominica's physical planning legislation deals largely with terrestrial resources leaving ***inadequate regulatory control over aquatic, coastal or marine resources***.

9. There is no ***legally established institutional framework for coordinating environmental protection and natural resource management*** in Dominica.

10. There is ***no legislation to ensure environmentally sound and sustainable management of natural resources outside forestry and parks areas***.

11. There is ***no legislation for the management of marine pollution, biosafety or hazardous substances***.

12. There is ***no legislation to control Greenhouse Gas (GHG) emissions or promote energy efficiency and the use of renewable energy.***

13. Consolidated ***Environmental, Climate Change and Development legislation is required as an urgent national priority*** which should address the following gaps and deficiencies:
    (a) legislation is required to address pollution and hazardous substances, climate change, introduction of new technologies and to implement Multilateral Environmental Agreements (MEAs) to which the country is a signatory;

    (b) legal establishment of a department or agency is required to facilitate functional site-specific co-ordination for effective environmental protection and natural resource management;

    (c) the establishment of effective and coordinated site-specific management of natural resources and environmental protection - for example by Certificate of Environmental Clearance (CEC) as used in Trinidad or a Resource Management Permit as used in New Zealand.

14. During the National Consultative Workshop on the 19th – 20th January 2011, stakeholders representing members of the legal community, senior technical officers from key government ministries/departments/agencies, environmental NGO's and academia, private sector:

    (a) reviewed recommendations arising from the 26th April 2010 national workshop concerning Dominica's legislation for environmental and natural resource management;
    (b) reviewed key legislative frameworks for environmental and natural resource management in select Caribbean countries and other relevant jurisdictions;

(c) identified and prioritised viable options for Dominica's proposed legislation for environmental and natural resource management;
(d) developed the outline of Dominica's proposed legislation for environmental and natural resource management to guide the legal drafting process;
(e) identified key steps in the legislative development/approval process including the drafting of Environmental, Climate Change and Development Legislation for Dominica through broad-based stakeholder consultation.

15. In July 2012 Cabinet approved the drafting of comprehensive Environment, Climate Change and Development Legislation in line with recommendations from the National Consultative Workshops.

Proposed Provisions within the New Legislation

The following sections outline key provisions and clauses that are to be included in Dominica's proposed *Environment, Climate Change and Development Bill.*

- Preamble:- Outlines the scope of the proposed legislation, and lists the international agreements that are implemented under the legislation.

- Defines the Purpose of the legislation, namely to

  (a) to foster the transformation to sustainable development in Dominica by establishing the legal and institutional framework to ensure that agricultural, coastal, forestry and other terrestrial land and resource uses in Dominica are sustainable, thereby allowing for the maintenance of productive systems that assure ecosystem productivity and ecological functions while contributing directly to the environmental, economic and social well-being of the people of Dominica;

  (b) to implement international and regional environmental treaties and agreements to which Dominica is a signatory including:

    (i) St. Georges Declaration (2001)

    (ii) OECS Environment Charter

    (iii) Millenium Development Goals

    (iv) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

    (v) UN Convention on Biological Diversity

(vi) Cartagena Protocol on Biosafety

(vii) Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean, Oil Spill Protocol and Conservation Protocol

(viii) International Convention on Civil Liability for Oil Pollution Damage

(viii) UN Framework Convention on Climate Change

(ix) Cotonou Agreement

(x) UN Convention to Combat Desertification

(xi) UN Convention on the International Trade in Endangered Species of Wild Fauna and Flora(CITES).

- Part I - Preliminary: - Outlines the date of commencement of the proposed legislation specifies that the Act shall bind the Government, and provides for a variety of definitions.

- Part II- Outlines the duty to protect the environment. Explains the responsibility of the Government to protect the environment and also extends this duty to all persons in Dominica.

- Part III - Administration: - Establishes the Council on Environment, Climate Change and Development (CECCD) to be co-chaired by the Prime Minister and the Minister for Environment, Physical Planning, Natural Resources and Fisheries. Sets out the duties, powers and responsibilities of the Council which shall perform as the highest authority on environmental matters. Establishes the Department of Environment, Climate Change and Development (DECCD) and sets out the powers of the Dpartment and its members. It defines the duties and function of the members of the Department, and specifies the term of appointment of staff members including the Director. Provides for the establishment and administration of a public environmental registry. Establishes a Climate Change Trust Fund, administered by a Board of Trustees, and specifies the purpose for such a fund. Provides for the collection of carbon levies, fees for costs associated with the undertaking any inspections, environmental rehabilitation or audit under the Act. Requires regular National State of the Environment Reports to be prepared, and defines the procedures for formulating such reports with the broadest possible public participation. Provides for the periodic review of the Act. Requires that an effective and integrated sustainable development policy formulation process be established within a variety of government

ministries, departments and agencies, and outlines the process for the formulation of such policies ensuring the broadest possible public participation. Requires the Accountant General to undertake regular sustainable development assurance audits of government ministries, departments, and agencies.

- Part IV - Environmental Impact Assessment:- Establishes an environmental impact assessment process, administered by Department of Environment, Climate Change and Development (DECCD), to be undertaken by all government ministries, departments and agencies for all proposed developments, undertakings or other activities which are likely to cause an adverse impact on human health, society or the environment, or which are at risk from climate change impacts. Defines the nature of activities that are subject to an environmental impact assessment, and specifies activities that do not require such an assessment. Defines the environmental impact assessment process, including procedures for screening, scoping, and the preparation of a comprehensive study report or a mediation report where alternative dispute resolution has been utilised. The process provides for the greatest possible public participation, and ensures that the public has access to information concerning any proposed activity. Provides for the Issue of a Certificate of Environmental Clearance which contains conditions for any approved activity. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part V – Climate Change and Disaster Management: - Establishes the organizational structure to effectively respond to risks from climate change, natural disasters, and chemical/oil spill incidents on a national basis. Provides for the designation of an Ozone Unit and Climate Change Unit within the Department of Environment, Climate Change and Development (DECCD) and defines the powers, duties and responsibilities of these units. Provides for the phasing out of ozone depleting substances by certain dates, and establishes procedures for the management, storage and processing of such substances. Requires the licensing of persons to handle ozone depleting substances, and establishes duties, responsibilities and offences in relation to the control or disposal of such substances. Requires the formulation and implementation of an Ozone Depleting Substance Strategy and Action Plan. These provisions give effect to the requirements under the *Vienna Convention for the Protection of the Ozone Layer* and *Montreal Protocol on Substances that Deplete the Ozone Layer.* Sets targets for the reduction of Green House gases to give effect to the requirements under the *United Nations Framework Convention on Climate Change.* Defines the responsibilities of the Climate Change Unit, including to coordinate the implementation of Dominica's climate change risk management (adaptation) programs, formulate and implement government's strategy and action plan with regard to the management and control of greenhouse gases, and compile a complete inventory of sources of emissions of such gases. Requires the formulation and implementation of a National Policy for the Reduction of Emissions from

Greenhouse Gases which ensures the broadest possible public consultation and participation. Provides for the enactment of Regulations to give effect to the Policies and action plans.

- Part VI - Energy Conservation:- Establishes an Energy Conservation Unit within the Department of Energy, with the responsibility to formulate and implement government's strategy and Action Plan with regard to the conservation of energy and the promotion of increased efficiency of energy use. Outlines the procedure for the formulation of the Energy Conservation Strategy and Action Plan which ensures the broadest possible public participation and consultation. Provides for the enactment of Regulations to give effect to the Energy Conservation Strategy and Action Plan.

- Part VII - Pollution and Waste Management - General: - Outlines the procedure for the formulation and implementation of a Policy on Integrated Waste Management, which ensures the broadest possible public participation and consultation. Provides for the enactment of Regulations to give effect to the Policy on Integrated Waste Management.

- Part VIII - Air Pollution: - Outlines the procedure for the formulation and implementation of a Policy on Air Pollution Management, which ensures the broadest possible public participation and consultation. Provides mechanisms for the regulation of discharges into the atmosphere, and prohibits the use of leaded petrol. Establishes air pollution standard for motor vehicles and empowers the Director of Road Transport to enforce such standards through the utilization of a process requiring regular vehicle inspections. Provides for the enactment of Regulations to give effect to the Policy on Air Pollution Management.

- Part IX - Marine Pollution: - Establishes an effective process for implementing port state control, thereby ensuring a reduction in the risk of marine pollution from ships by providing an inspection procedure to verify compliance with requirements under international agreements such as the *International Convention for the Prevention of Pollution from Ships 1973, as Modified by the Protocol of 1978 (MARPOL 73/78)*. Prohibits the dumping of wastes by ships and aircraft, and establishes a procedure for the issue of special licences, thereby implementing the requirements of the *Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter (London Dumping Convention).* Regulates the manner of disposing of wastes generated by ships, and requires the discharge of such waste into facilities provided at designated ports, thereby giving effect to the *International Convention for the Prevention of Pollution from Ships and Related Protocols (MARPOL 73/78).* Establishes powers for the Marine Department or any delegated authority to take such measures as may be necessary to prevent, mitigate or eliminate grave and immediate danger to Dominica's coastline from pollution, thereby giving effect to the *International Convention Relating to Intervention*

on the High Seas in Cases of Oil Pollution Casualties, 1969. Establishes liability for oil pollution damage from ships in accordance with provisions under the *International Convention on Civil Liability for Oil Pollution Damage, 1984* and the *International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1984.* Provides for the regulation of pollutants from land-based sources. Empowers the Minister to designate any substance as a marine pollutant, and declares the substance tributyltin (TBT) as a marine pollutant which may not be applied to any vessel in the form of anti-fouling paint. Establishes powers of enforcement in events of marine pollution incidents, and requires various parties to report in the event of marine pollution incidents. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part X - Management of Hazardous Substances: - Regulates the import, export, transportation, storage, selling or disposal of any hazardous substance or waste. Empowers the Minister to prohibit the importation of any hazardous substance. Establishes requirements for the labelling and marking of hazardous substances, and requires specific documents to accompany any hazardous substance in transit by air, sea or on land. Requires the segregation of hazardous substances, and the provision of placards on vehicles that are transporting such substances by road. Restricts the importation of hazardous substances to controlled areas, and specifies the procedures to be undertaken in the importation and exportation of any such substance, and for their handling in any controlled area. Provides procedures for the storage of hazardous substances in any area, and for transportation of such substances by road and on inland waterways. Establishes a permitting system to control the import, export, transport, and storage of all hazardous substances. Prohibits the dumping of any hazardous waste, strictly controls the import and export of hazardous waste, and establishes strict requirements relating to the movement of hazardous waste in transit at sea. Requires that a National Hazardous Waste Management Policy be formulated and implemented through the broadest possible public consultation and participation. Establishes duties and responsibilities on those parties in control of any hazardous substance, and establishes penalties on any person who fails to comply with such responsibilities. Provides for the enactment of Regulations to give effect to the requirements of this Part. Provides for the establishment, review and implementation of a National Hazardous Substances and Disaster Contingency Plan, establishes the procedure to be employed in the event of an incident, and imposes duties to report pollution incidents upon various parties. Provides for the enactment of Regulations to give effect to the requirements of this Part. Establishes regulations for the management of hazardous substances in the workplace

- Part XI - Water Quality Management: - Requires the formulation and implementation of a Policy on Water Quality Management through the broadest possible public consultation

and participation. Any discharges into any water resources shall be in accordance with the requirements of the approved Integrated Policy on Water Quality Management. Prohibits the pollution of any water resource, and provides for the enactment of Regulations to give effect to the requirements of the Policy on Water Quality Management.

- Part XII - Environmental Management: - Requires any industrial of commercial facility that:
  - discharges any waste or pollutant;
  - handles any hazardous substance;
  - produces any waste, pollutant or hazardous substance; or
  - engages in any activity that is likely to impact human health or the environment,

  to negotiate and conclude an appropriate Code of Environmental Practice within three years of the Act coming into force. Establishes the procedures for negotiating and concluding such Codes of Environmental Practice, which may be based on the ISO 14000 series standards. Defines the content of the Codes of Environmental Practice, and requires broad-based public consultation and participation in the approval of such codes. Establishes procedures for the monitoring and audit of Codes of Environment Practice, and for enforcement in the event of non-compliance. Provides that the Department of Environment, Climate Change and Development (DECCD) may issue standards, procedures and guidelines to give effect to the requirements of this Part.

- Part XIII - Resource Management - General: - Establishes a National Resource Management Unit within the Department of Environment, Climate Change and Development (DECCD) with specific duties and responsibilities to undertake an extensive inventory of Dominica's natural resources, and thereafter to formulate and implement a National Resource Management Plan. Defines the scope of the National Resource Inventory, and delineates the procedure to be undertaken for the formulation and implementation of the National Resource Management Plan which shall ensure the broadest possible public consultation and participation. Provides for the issue and enforcement of soil conservation enforcement notices. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part XIV – Protection of Carbon Sinks: - Requires the Department of Forest to initiate the establishment of a Forestry Resource Inventory, which shall include information concerning the nature of forestry resources and forestry ecosystem diversity, forest ecosystem condition and productivity, and the location of nationally significant forest resources or biospheres. Requires the Department of Forests to establish a management plan for the protection and conservation of carbon sinks. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part XV - Integrated Coastal Zone Management: - Provides for the establishment of a Coastal Zone Management Committee – reporting to the Council on Environment,

Climate Change and Development (CECCD) - to provide effective and co-ordinated decision making on coastal zone planing, development and management. Defines the functions of the Coastal Zone Management Committee, and specifies the term of appointment of members. Establishes a permitting process to regulate development activities in the coastal zone, and defines the permit approval process. Defines development activities that are generally prohibited, and specifies activities that are exempt from the permitting process because of the traditional nature of such activities. Establishes measures for the monitoring and audit of development activities that are subject to a permit. Provides for permit exemptions in instances where emergency action may be required, or for activities undertaken to maintain any navigational channel. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part XVI - Biosafety Management: - Provides for the establishment of a Biosafety Committee - reporting to the Council on Environment, Climate Change and Development (CECCD) - with specific responsibility to manage the importation and use of genetically modified organisms. Establishes the procedures to manage the importation and use of genetically modified organisms. Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part XVII - Trade in Endangered Species - Provides for the establishment of a CITES Committee - reporting to the Council on Environment, Climate Change and Development (CECCD) - with specific responsibility to manage the trade in endangered species to give effect to the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention).* Establishes the procedures to manage the trade in endangered species. Provides for the control on the import and export of foreign animals, plants, insects and organisms through the establishment of a permitting process. Provides for the regulation of captive specially protected animals that are captive at the time the Act comes into force. Provides for the protection of wildlife on private and native lands, with penalties for any violation. Establishes a system of permits to regulate the trade of endangered species, thereby giving effect to the requirements under the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention).* Provides for the enactment of Regulations to give effect to the requirements of this Part.

- Part XVIII – Access and Benefits Sharing - Establishes procedures to regulate biodiversity prospecting which includes a permitting process. Provides that the Government of Dominica together with civil society exercises sovereign rights over the biological resources existing in the country and recognizes that it is the duty of the state and its citizens to regulate the access to biological resources as well as related use of community knowledge and technologies. Provides for promotion and support of indigenous and traditional technologies and implementation of relevant provisions of the

convention of biodiversity. Defines access to genetic resources and benefit-sharing and provides guidance for Access and Benefit-sharing of Genetic resources.

- Part XIX - Penalties and Enforcement: - Establishes a variety of offences under the Act, and defines the penalties to be imposed. Penalties include:

  (a) for intentionally causing any pollution which results in harm to human life or safety or severe damage to the environment - a fine of five hundred thousand dollars or to imprisonment for a period of ten years, or to both such fine and imprisonment;

  (b) for the discharge of any pollution from any ship or any commercial or industrial facility in cases of gross negligence or which result in serious impairment of human health or death, or in cases which result in severe damage to the environment:

    i) for a first offence - a fine of one hundred thousand dollars or to imprisonment for a period of five years, or to both such fine and imprisonment;

    ii) for a second or subsequent offence - a fine of five hundred thousand dollars or to imprisonment for a period of ten years, or to both such fine and imprisonment;

  (c) for the control of any hazardous substance in contravention of the requirements of the Act - a fine of one hundred thousand dollars or to imprisonment for a period of not less than five years, or to both such fine and imprisonment;

  (d) for the discharge of any pollutant from any ship or any commercial or industrial facility:

    i) for a first offence - a fine of ten thousand dollars or to imprisonment for a period of not more than one year, or to both such fine and imprisonment;

    ii) for a second or subsequent offence - a fine of twenty thousand dollars or to imprisonment for a period of not more two years, or to both such fine and imprisonment;

  (e) for trading in endangered species in violation of the provisions of the Act - a fine of fifty thousand dollars or to imprisonment for a period of not more two years, or to both such fine and imprisonment;

  (f) for failing to comply with any conditions of any permit - a fine of twenty thousand dollars or to imprisonment for a period of not more one year, or to both such fine and imprisonment;

(g) for committing any other offence for which a specific penalty is not provided - a fine not exceeding two thousand dollars.

(h) Provides that for every day an offence continues, the person who committed the offence may be convicted for a separate offence for each day the offence continues.

(i) Establishes liability of directors, officers or agents of any company that has committed an offence.

(j) Establishes burden of proof, and provides for various matters relating to evidentiary proof.

(k) Establishes defence for any offence involving a pollution incident whereby the accused person shall be acquitted if it can be proved that a Code of Environmental Practice was in force and the person took all reasonable measures to implement the Code and to prevent the pollution.

(l) Establishes powers for various environmental inspectors. Provides for employee protection in cases where pollution incidents at a workplace are reported to the authorities.

- Part XXII - Repeals and Savings: - List provisions and sections within existing legislation that are to be repealed, replaced or amended as necessary.

- Schedules: - Schedules include: air quality criteria; list of controlled substances; list of prohibited wastes and other matter; list of wastes and other matter requiring special permit for dumping; list of classes of hazardous substances; list of small quantity limits of hazardous substances exempted from the requirements of Part X; example of labels to be affixed to hazardous substance containers or packaging; table of minimum sizes for hazardous substance labels; example of Shippers Dangerous Goods Declaration for Air, Sea and Land; example of Dangerous Goods Declaration; table of segregation requirements for hazardous substances transported by road; list of categories of hazardous wastes; list of information to be provided on notification to export hazardous waste; water quality management criteria and guidelines; example of permit for the removal of biodiversity prospecting specimens; list of protected wildlife; CITES convention export and import permits; CITES convention re-export certificate; CITES convention certificate for introduction from the sea; and CITES convention certificate of acquisition.

Annex 6 (b)

ASSISTING THE PRIVATE SECTOR IN THE EASTERN CARIBBEAN REGION MANAGE THE RISKS FROM CLIMATE CHANGE

DEVELOPMENT

OF A CLIMATE CHANGE ADAPTATION

MANAGEMENT SYSTEM (CCAMS) STANDARD

WITH TECHNICAL GUIDANCE

Bureau of Standards, Dominica

in collaboration with

CANADIAN STANDARDS ASSOCIATION

Caribbean Community Climate Change Center

INTRODUCTION

The Dominica Bureau of Standards working in association with the Bureaus of Standards of Grenada and Saint Vincent and the Grenadines[14] seek to develop and implement an Environmental Management/Climate Change Adaptation Certification Scheme (based on risk-based standards) to assess and manage private sector risks from climate change that can be fully integrated to organizations' quality and/or environmental management systems such as ISO 9000 and ISO 14000 standards. This initiative is to be undertaken with the Caribbean Community Climate Change Centre (CCCCC) and the Canadian Standards Association (CSA) which is the Technical Lead for both the ISO 9000 and ISO 14000 standards.

The standard would assist private sector decision makers assess the risks associated with various climate impacts to key sectors (agriculture, tourism, financial services, water, energy, manufacturing) and supporting infrastructure/operations having an effect on the quality of service provided to customers. It would also help organizations define and execute appropriate response measures. The management standard and technical annex would be developed and approved by the Bureau of Standards in the three participating OECS countries. The technical annex would be based on climate impacts information made available by the CCCCC. CCCCC and CSA would assist the Bureaus of Standards with training and building capacity of national technical committee at the standards development stage; assist with the design and development of a model environmental management certification scheme; provided training on how best to apply the standards and implementation of a national certification scheme.

Once developed, the proposed management standard may be submitted to the International Organizations for Standardization (ISO) as a seed document for the development and approval of an international standard. This tool could therefore be used in other regions vulnerable to climate change.

B. IMPACTS OF A CHANGING CLIMATE ON THE CARIBBEAN

The Caribbean is one of regions vulnerable to climate change. Over the coming decades, climate change will affect the Caribbean's geography, ecology, economy and population. Some impacts are being observed now. And scenarios regarding future impacts are being documented and tested.

Sea level rise, for example, may affect freshwater supply, increase beach and coastal erosion, result in permanent coastal flooding in some areas, and aggravate the impact of tropical storms. It also threatens a disproportionate share of industrial, tourism, energy, transport, and communications infrastructure concentrated in the coastal zone. The Intergovernmental Panel on Climate Change (IPCC) has recently calculated first order costs for protection of Caribbean shorelines from future sea level rise, including low coasts, cities, harbors, island elevations, and beach nourishment. The projected cost of new construction for protection alone could reach US$11.1 billion. Most of these costs will likely have to be borne by

[14] The Bureau of Standards in Dominica, Grenada and Saint Vincent and the Grenadines have agreed to collaborate on this initiative and, during detailed project preparation, will invite the other OECS PPCR pilot country (Saint Lucia) to participate.

Caribbean public and private sector organizations. Factoring climate change impacts into decision making now will result in lower overall adaptation costs.

Other climate change impacts affecting Caribbean organizations include but are not limited to rising air and water temperatures, increase in frequency and severity of weather events and increase in vector borne diseases.

C. INTEGRATING CLIMATE CHANGE CONSIDERATIONS TO PRIVATE SECTOR DECISION MAKING

Decision-makers in the private sector are generally aware that climate change may be affecting the operations of the organizations they manage in the future. Few, however, have access to relevant information and management tools to assess present and future risks associated with climate change and to integrate these risks to business planning and operations. One key challenge is therefore to transfer climate change information and knowledge to private sector organizations in an appropriate format to facilitate adaptation.

1. ISO 9000 and ISO 14000

The ISO 9000:2000 series was developed to assist organizations of all types, public as well as private sector, and all sizes to implement and operate an effective quality management system (QMS). By definition, a management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives. It includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.

The ISO 14000 series consists of approximately 20 standards covering management systems specification, products-oriented support tools for life cycle assessment and labelling, special technical reports, nomenclature or informative references, and performance evaluation and auditing tools. ISO 14000 is used to develop and implement environmental policy and manage environmental aspects.

Both management standards are based on similar principles, terminology, structure and format. Incorporating climate information to existing management systems used by organizations would have many advantages. Globally, there are over 740,000 organizations officially certified by third party registrars accredited in 150 countries through the ISO and its related national standards systems. The actual number of both registered and unregistered management systems based on the ISO 9000 quality management and ISO 14000 environmental management standards is likely a significant multiple of those certified by registrars. This is to say that finding away to integrate a risk based adaptation standard into these systems could have profound impacts on GHG adaptation strategies worldwide.

D. HAVING THE STANDARD DEVELOPED BY INTENDED USERS

As stated above, Caribbean countries are more vulnerable to a changing climate than many other regions. Caribbean private sector therefore have a strong motivation to take the lead in developing and in implementing cost effective and practical tools to foster adaptation. Some argue that successful

adaptation strategies are necessary to ensure the survival of the most vulnerable regions to climate change.

Private and public sector organizations have an important role to play in designing and implementing successful adaptation strategies. To be successful, the approach should be based on credible regional information and be designed by intended users. CCCCC and CSA are proposing to work with the Bureau of Standards in the three participating OECS countries to develop the management standard and technical annex. This would result in increased capacity for standards development in the Eastern Caribbean States. More importantly, it would ensure that affected organizations design the tools that best meet their needs and reflect their particular circumstances.

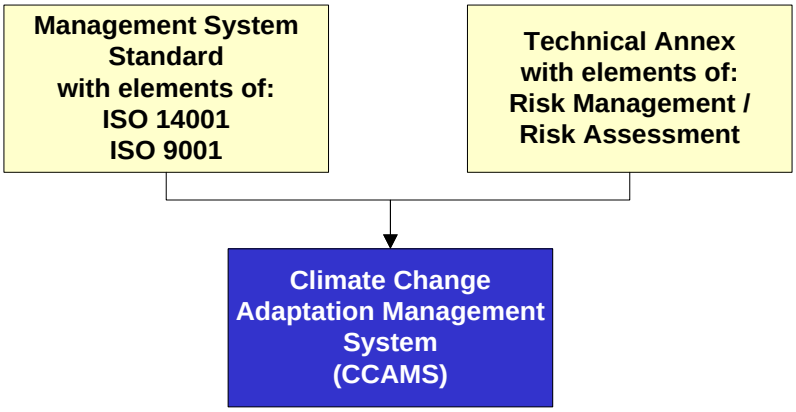
SCOPE

The proposed Climate Change Adaptation Management System (CCAMS) would consist of requirements and a technical annex. It is envisioned that the CCAMS will be designed to align with key requirements from the ISO 9001 and ISO 14001 standards with elements of risk analysis integrated into the resulting management system standard and technical annex as shown in Figure 1. The proposed CCAMS will allow organizations to:

- Identify and assess risks to products, services, and infrastructure
- Establish risk tolerance level
- Assess current system of controls
- Evaluate residual risk
- Determine and set quality objectives and requirements for the adapted product, service, and infrastructure
- Assess adaptation options for products, services, and infrastructure
- Measure the performance of the adapted product, service, and infrastructure

The results of this project will complement and support ongoing climate change adaptation and disaster risk-management programs within CARICOM and OECS Member States, build and further strengthen the institutional capacity of the Bureau of Standards in the three participating OECS countries, and will facilitate the training and upgrading of environmental managers/auditors within the OECS region. Most importantly, the project will result in the establishment of an effective management mechanism to reduce the vulnerability to climate change impacts of vulnerable economic sectors within the Eastern Caribbean region.

Figure 1 – Elements of the proposed CCAMS



It is recognized, however, that additional work will be required to upgrade the key codes, standards and other rules used in the Eastern Caribbean to design, build, operate, maintain, modify and decommission infrastructure.

PROPOSED APPROACH AND METHODOLOGY

E. Approach

As outlined above, the Dominica Bureau of Standards, CSA and CCCCC believe that a collaborative approach to developing the CCAMS is essential to ensuring the standard and technical annex are both relevant and implement-able in the Eastern Caribbean Region and in other regions vulnerable to climate change. Key contributors and collaborators will include Bureau of Standards in the three participating countries, and private, public sector participants.

F. Detailed Work Plan

CCCCC will act as the project leader and the interface with the international development partner (UNDP) for this project. CCCCC will designate a **Project Coordinator** to manage the contract and key deliverables under the contract. The input from CSA will be managed through a sub contract between UNDP, CCCCC and CSA. A **Project Steering Committee** comprised of representatives from CCCCC, CSA and representatives from the Bureau of Standards in the three participating OECS countries will be created. CCCCC, CSA and Bureau of Standards in the three participating countries will execute this assignment in 3 phases:

Phase 1 - Pre-Management System Development
• Support the selection of working group members to develop the seed document; • Support the preparation of a working draft of the CCAMS (Seed Document); • Support the establishment of the Standards Development Committee (SDC); • Prepare training materials for the Chair and SDC; and • Prepare the Terms of Reference for the SDC.

Phase 2 – Management System Development
• Work with the standards development committee to develop the draft standard; • Support the design and implementation of a public review process for the standard; • Support the collection, analysis, and disposition of public review comments; and • Develop and Submit ISO New Work Item Proposal for CCAMS.
Phase 3 – Management System Implementation
• Support the development of CCAMS Implementation Tools and Processes; • Support the design and implementation of the Pilot Program; • Finalize the CCAMS and Implementation Tools and Processes; and • Support the development of a maintenance plan for the standard.
Project Management

Phase 1 - Pre-Management System Development

Task 1.1 – Kick-off Meeting

- The Project Team will organize a kick-off meeting to:
    - Address administrative requirements of the contract;
    - Confirm timelines and milestones;
    - Discuss reporting preferences and meeting dates;
    - Confirm the process and roles of Project Team members;
    - Establish specific knowledge transfer priorities for local partners;
    - Select criteria to be used for the engagement of sub-contractors and committee experts;
    - Discuss assumptions and other issues;
    - Review and update work plan.

- Throughout the project, CSA will provide regular project updates to CCCCC and the Bureau of Standards in the three participating OECS countries. Reporting preferences and processes will be discussed at the kick-off meeting.

Task 1.2 - Identify working group of experts

- The identification and recruitment of working group members for the development of the draft standard will be executed in close cooperation with the Bureau of Standards in the three participating OECS countries.

Task 1.3 – Develop Seed Document (Draft Standard and Technical Annex)

- The seed document will be used by the Standards Development Committee to guide the standards development process and will largely be based on elements from the ISO 14001 and ISO 9001 Standards.

- In developing the seed document, the Project Steering Committee and the working group of experts will work collaboratively to agree on the objectives, scope and contents of the document. The draft seed document for the CCAMS may include requirements that address components including but not limited to:
    - Risk identification and assessment of products, services, and infrastructure due to the potential impacts of climate change
    - Assessment of risk tolerance level
    - Assessment of existing system of controls to manage risks
    - Residual risk evaluation
    - Setting quality objectives and requirements for the adapted product, service, and infrastructure
    - Assessment of adaptation options for products, services, and infrastructure to meet quality objectives
    - Measuring the performance of the adapted product, service, and infrastructure

- The Technical Annex will cross-reference the impacts of climate change to different categories of risks associated with various climate impacts to key sectors (agriculture, tourism, financial services, water, energy, manufacturing) and supporting infrastructure/operations having an effect on the quality of service provided to customers for the Eastern Caribbean region. CSA will collaborate with CCCCC and the Bureau of Standards in the three participating OECS countries to identify specific risks to key sectors (agriculture, tourism, financial services, water, energy, manufacturing) and supporting infrastructure/operations to develop responses for climate change impacts; determine which categories of risks are applicable; develop the required expertise profiles, solicit for the necessary expertise, develop baseline expectations and outcomes for the development of seed documents. The draft technical annex would:
    - Identify and describe in detail of various known climate change impacts affecting key sectors (agriculture, tourism, financial services, water, energy, manufacturing) and supporting infrastructure/operations;
    - Describe various scenarios of severity for each impact;
    - Classify locations within the three participating countries more and less affected;
    - Identify likely timeframe when impacts would start to occur;
    - Describe potential implications of each impact for various sectors of the economy; and
    - Describe potential implication of each impact on key sectors and associated infrastructure.

The methodology used to develop the Technical Annex would likely be similar to the model that will be used for ISO14000 series work.

1. Start-up Phase

CSA will provide an analysis of lessons learned from prior initiatives (for example the development of the ISO14064 standards); and collaborate with CCCCC and the Bureau of Standards in the three participating OECS countries to establish specific knowledge transfer priorities for local partners; develop a draft terms of reference for expert committees and working groups; identify and confirm the availability local stakeholders and expertise; and select criteria to be used for the engagement of sub-contractors and committee experts.

A literature review will be needed to identify the key objectives (and if these are economic, environmental, cultural, or societal in nature) as related to each category of risk affecting the key sectors. CSA will support a literature review that will look at existing risk management processes and capabilities; identify applicable codes, standards, local customs, and other applicable local practices; review enforcement and inspection practices. This would be done by qualified technical experts subcontracted by CSA who are specialized in each key sector and who have a strong knowledge of local conditions and practices. CSA would assist in the specification and selection of such expertise.

2. Scoping Phase

CSA will collaborate with CCCCC and the Bureau of Standards in the three participating OECS countries to identify specific categories of risks to key sectors and associated infrastructure to develop responses for; determine which categories of risks are applicable; develop the required expertise profiles, solicit for the necessary expertise, develop baseline expectations and outcomes for the development of seed documents

3. Committee and Working Group Member Selection

CSA will assist CCCCC and the Bureau of Standards in the three participating OECS countries in the evaluation and selection of qualified experts for research and for the development of seed documents.

Training to committee members in the Bureau of Standards in the three participating countries will be as per the CCAMS standards development committee. CSA will provide support or training to a local secretariat.

4. *Draft Development*

Development of the Technical Annex seed document will be as previously described for the CCAMS seed document.

4a. *Public Review*

A 60-day public review will provide an opportunity for stakeholders that have not been directly involved in the process to provide feedback on the draft Technical Annex document to the committee. CSA and the Bureau of Standards in the three participating OECS countries will support the collection of comments, and will assist the Chair of the committee in the consideration of the comments for incorporation into the draft.

5. *Establish the Parameters for Pilot-testing & Maintenance Recommendations*

CSA and the Bureau of Standards in the three participating countries will assist in the development of appropriate performance and success indicators for the pilot-testing.

CSA will assist in identifying the appropriate review cycle for the protocols (recognizing that they must be kept up to date).

Task 1.4 - Recruit Standards Development Committee (SDC) members and committee Chair

- The identification and recruitment of standards development committee members will be executed in partnership with CCCCC and the Bureau of Standards in the three participating countries. Membership on the CCAMS committee and technical annex working groups would comprise CCCCCC staff, representatives from the Bureau of Standards in the three participating countries, local interests as appropriate, and supplemented by CSA staff acting in an advisory capacity.

- The Project Steering Committee will identify an individual to serve as the Chair of the Standards Development Committee. The Chair, with support from the CSA Project Manager, will be required to facilitate SDC discussions, achieve consensus amongst SDC members, and ensure the objectives of the meetings are met within the specified timeframe.

Task 1.5 –Provide training support to committee and Chair

- CSA in collaboration with CCCCC and the Bureau of Standards in the three participating countries will determine the type of training to be delivered to the Chair and SDC members in terms of content specific training and training on the standards development process. Training material that already exists within CCCCC and the Bureau of Standards in the three participating countries will be reviewed, enhanced (if required) and customized to meet the training needs of the Chair and committee. Training will be provided to the Chair and Committee members at the first SDC meeting. CSA will also provide support or training to a local secretariat.

Task 1.6 - Prepare Terms of Reference for the SDC

- To help guide the work of the Project Team as well as the committee members, Proposed Terms of Reference and a Project Charter will be presented at the first SDC meeting.

Outputs from this phase:

- A revised work plan and project schedule.
- CCAMS Seed Document and Technical Annex
- Training materials for Chair and committee members
- Terms of Reference

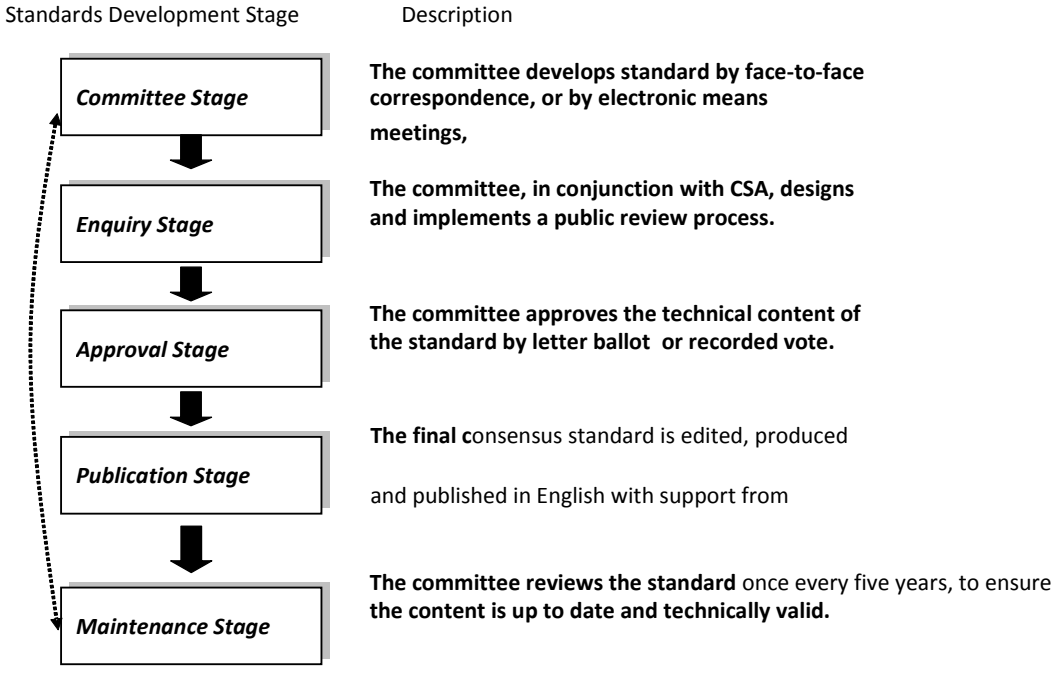
Phase 2 – Management System Development

Task 2.1 - Develop Draft Standard and Technical Annex (prepare for, manage, and follow-up on outcomes of six (6) SDC meetings)

- The scope of work would include:
    - Prepare for, manage, and follow-up on outcomes of six (6) SDC meetings.
    - Sharing of lessons-learned related to similar climate change adaptation standards work being undertaken in Canada and other jurisdictions
    - Providing advice and decision-support to OECS stakeholders
    - Providing assistance with the development of technical content appropriate for application within the Eastern Caribbean Region

- Standard Development Committee (SDC) will meet to develop the CCAMS. The standards development process consists of five stages. Figure 1 provides an overview of the standards development process.

Figure 2: Standards Development Stages



- CSA proposes to support the management of six (6) two-day long SDC face-to-face meetings with the following objectives:

Meeting	Objective
Meeting 1	To train Committee Members, review project plan, approve Terms of Reference, and introduce seed document
Meetings 2, 3, and 4	To develop of Draft Standard and Technical Annex
Meeting 5 and 6	To address public review comments received and approve Final Standard

- Based on technical requirements of the standard, there may be a need for specialized knowledge. This may require the establishment of sub-committees to work on certain aspects of the standard. The work of the sub-committees will occur in parallel to the work of the committee.

- A CSA Project Team Member will document the outcomes, issues, and will note any action items that were agreed to at committee meetings. Between meetings the CSA Project Team guide the drafting, editing, and updating the draft standard based on the results of the committee meetings. CSA may support the management of draft versions of the standard, make necessary updates / changes, and ensure the standard goes through a quality review and editing processes (to ensure compliance with ISO drafting policies).

- Committee documents will be managed through the use of a secure, password protected web-based collaboration workspace which allows for the efficient sharing and reviewing of documents among committee members.

Task 2.2 - Design and Implement Public Review Process for Standard and Technical Annex

- Public Review is an important part of the standards development process. It provides an opportunity for stakeholders that have not been directly or actively involved in the process to provide feedback to the committee. CSA, in consultation with the committee, will design and implement a minimum 60-day public review period where the draft technical standards will be made available for public review and comment.

- Should wider public consultation be required, additional techniques could be employed such as online consultations or facilitated consultation sessions with those stakeholder groups who were not initially involved in the development process.

Task 2.3- Collect, Analyze, and Disposition Public Review Comments

- CSA will support the collection and analysis of comments on the draft standard. The SDC will review comments and update the standard as required at Meetings 5 and 6. The final standard will undergo editorial review, formatting, and will be published in English.

Task 2.4 – Develop New Work Item Proposal to ISO

- **It will be important to undertake discussions with the International Standards Organization to develop and agree on a mutually appropriate and cooperative approach to the project to ensure that the standards developed under the project achieve the level of international recognition required to ensure universal acceptance and use. CSA will play a key role in promoting and championing the Eastern Caribbean standard within the ISO organization. CSA will support the development of the New Work Item Proposal including providing documentation on the scope of the proposed standard and the justification for the standard.**

Outputs from this phase:

- Standards development and project management support at SDC Meetings 1-6;
- Draft Standard and Technical Guidance for and stakeholder review, comment, and approval;
- Documentation of Public Review Comments;
- Final Draft Standard; and
- ISO New Work Item Proposal

Phase 3 – Management System Implementation

Task 3.1 - Develop CCAMS Implementation Tools and Processes

CSA will consult with committee members, and other key stakeholders in the development of implementation tools and processes. The following implementation tools and processes may be developed to support the implementation of the CCAMS.

1. Interpretive Guide - The interpretive Guide will be a companion document that accompanies the standard. This guide will provide additional details about the purpose and intent of each of the clauses in the standard. The document will also provide examples of internal controls, activities, policies, and procedures that can be implemented within an organization in order to meet the requirements of the standard.

2. Communication Framework - Effectively communicating the purpose, intent, and expected results of the standard to each of the user groups will be critical in ensuring its uptake, implementation, and sustainability. The CSA Project Team work with CCCCC in developing key messages targeted at private sector organizations that.

3. Education and Training - Education and training respecting the new CCAMS will be necessary to ensure the appropriate application of the standard. The CSA Learning Centre will be engaged to support the development of a flexible, modular training package with associated trainer / participant tools that can be easily integrated should companies have existing ISO 14001 and / or ISO 9001 training programs.

Various materials and tools for trainers and participants can be developed. These may include:

- Trainers Manual;
- Participant Manual / Student Workbook;
- PowerPoint presentation and handouts;
- Case illustrations; and
- Implementation Workbook.

Training Material Content may include:

- Links to relevant clauses and supporting materials/resources;
- Information on relevant legislation / international frameworks;
- Links to relevant websites;
- Decision trees;
- Training modules (e.g., quizzes);
- Best practice and tips.

4. Conformity Assessment Process - CSA will provide recommendations on implementing a conformity assessment process to ensure the operating effectiveness of the CCAMS. Various types of conformity assessment schemes (not mutually exclusive) exist, including:

Conformity Assessment Scheme	Description	Example
Accredited	Accrediting body formally recognizes the competence of an organization to perform a particular conformity assessment function.	Quality Management Institute (QMI) is accredited by Standards Council of Canada (SSC)
Non-Accredited	Organizations performing a particular conformity assessment function operate without formal accreditation.	
First Party Audit	Internal audit conducted by implementing organization.	Basis for "self-declaration" See ISO/IEC Guide 22:1996 General criteria for supplier's declaration of conformity

Conformity Assessment Scheme	Description	Example
		Must be competent and credible
Second Party Audit	Audit conducted by a prospective/existing entity with a vested interest.	Consumer groups, stakeholders
Third Party Audit	Audit conducted by an independent organization or regulatory authority.	Quality Management Institute (QMI) audits and confirms performance
Complaint-Driven	Reactive process. Public awareness is critical. A complaint-driven system does not require the registration of databases or certification of company practices as meeting the standard.	
Surveillance Audits and Registry System	Periodic surveillance audits to renew registration. Certified organizations are approved and added to a publicly available central registry. Innovative way of involving public in monitoring compliance.	ISO Certification

Task 3.2 - Design Pilot Program

- The purpose of the Pilot Program is to demonstrate the applicability and benefits of implementing the standard through implementation within several organizations in the three participating OECS countries and gain acceptance of key stakeholders. Following SDC approval of the Final Draft Standard, CSA and the Bureau of Standards in the three participating countries will pilot test the application of the Standard within three organizations, identified by the SDC to understand from field experience the draft Standard's:
    - Applicability/feasibility - Is the draft applicable to organizations of various sizes and complexities?
    - Auditability - Are requirements clearly written and auditable?
    - Effectiveness - Does the draft standard add value to organizational decision-making?
- CSA will assist in the development of appropriate performance and success indicators for the pilot-testing.
- Participating organizations will be selected against specific criteria to ensure they represent a reasonable cross-section of organizations. CSA will solicit interest and gain commitment from an agreed upon number of organizations interested in participating in the Pilot Program.

Task 3.3 - Implement Pilot Program

- The CSA Learning Centre will deliver a 1-day training course to the organizations in the three participating countries that are participating in Pilot Program. The mode (e.g., delivery to staff, web-based, implementation workbooks) and location (e.g., CSA, remote) will be determined based on the characteristics and needs of the participating organizations.

- The Bureau of Standards in the three participating OECS countries and participating organizations will be responsible for implementing the CCAMS over a determined period of time. CSA will provide on-going implementation advice to participating organizations. In addition, CSA will pilot the Conformity Assessment Tool to allow organizations to reach conformance. Resources available to participating organizations will include any tools and processes developed for implementation purposes, for example:
    - The Standard;
    - Training Course Materials;
    - Communication Tools;
    - Implementation Workbook;

- Pre-assessment audits will be performed at each of the Bureau of Standards in the three participating countries and the participating organizations following the implementation period. The audits will evaluate organizational conformance with the Standard and will include desktop, on-site, and reporting activities.

- CSA in collaboration with the Bureau of Standards in the three participating countries will facilitate a Pilot Program Workshop to discuss experiences and audit reports. Discussion will focus on the ease of implementation and auditability of the Standard. Program participants, trainers, and auditors will be invited to recognize champions and recommend improvements to resource materials (e.g., Training Course, Implementation Workbook).

Task 3.4 - Finalize CCAMS and Implementation Tools and Processes

- "Lessons learned" from pilot applications will be used to improve the standard prior to finalization. A draft report detailing the design, execution, and results of the Pilot Program will be prepared and circulated to CCCCCC, the Bureau of Standards in the three participating OECS countries, and the committee. The pilot application report will, as appropriate, identify gaps or issues related to the Final Draft Standard, implementation tools, and conformity assessment processes. The report will recommend how the Final Draft Standard and associated processes might be improved in moving toward a Final Standard.

Task 3.5 - Develop CCAMS Maintenance Plan

- The Bureau of Standards in the three participating OECS countries will be responsible to ensure that the technical standard is kept up to date and technically valid insofar as is practicable. A decision will be taken by the committee to either reaffirm the technical standard in its current form or develop a new edition on a minimum 5-year cycle.

- When the standard is being considered for review, all related tools and processes must be revisited to ensure consistence and accuracy. Tools (e.g., guidebooks) and processes (e.g., conformity assessment program) may also be reviewed separately for use, need, and relevancy.

Outputs from this phase:

- Guidance Document
- Training Materials
- Conformity Assessment Recommendations
- A list of confirmed pilot site participants
- CCAMS Pilot Plan
- Pilot Application Report;
- Final CCAMS, Tools and Processes; and
- CCAMS Maintenance Plan

G. Key Project Deliverables:

The following key deliverables will be produced based on the work plan for Phase 1 and Phase 2 detailed in the previous section:

- Updated Project Work Plan and Project Schedule
- CCAMS (Management System Standard and Technical Annex) Seed Document
- CCAMS (Management System Standard and Technical Annex)
- ISO New Work Item Proposal

The following key deliverables will be produced based on the work plan for Phase 3 detailed in the previous section:

- Implementation Tools and Processes (Interpretive Guides, Communication Framework, Training, and Conformity Assessment Scheme)
- Final CCAMS, Tools and Processes
- CCAMS Maintenance Plan

H. Future phases

Once the management standard is approved for use in the Eastern Caribbean, CSA is prepared to propose the addition of a work item to a relevant ISO committee (either TC 176 accountable for quality or TC 207 accountable for environment issues) to facilitate its adoption and use by the international community.

The ISO is a non-governmental organization based in Geneva that was established in 1947. It is a federation of the national standard bodies of 149 countries that also include more than 500 international bodies and regional liaison members. ISO is maintaining more than 15,000 standards through more than 3000 technical groups. Standards are developed through a consensus-oriented process based on national input and broad stakeholder involvement. They are intended to be implemented worldwide and support global supply chains in almost every sector of the economy.

Since the 1992 U.N. Environment (Rio) Conference and Convention, many bodies such as the International Organization for Standardization (ISO) have been taking action and establishing increasingly important roles in the preparation and diffusion of new environmental tools, technical guidance and best practices. These are aimed at the need, particularly in the private sector, for supportive management system standards and technologies. A timely example of this is the ISO 14064 standard designed for GHG quantification, validation and verification at the organization and project levels.

PROJECT SCHEDULE

The proposed project schedule detailed in Figure 3 covers 27 month timeframe. The project schedule may be revised as a result of the following circumstances:

- Date of contract approvals;
- The availability of Project Steering Committee members, the Bureau of Standards in the three participating OECS countries, and stakeholders for meetings; and
- The availability and ability of Project Steering Committee members, the Bureau of Standards in the three participating countries and stakeholders to review draft deliverables within the timeframe allotted.

Figure 3 – Proposed Project Schedule

Work plan	FY 13/14													FY 13/14												
	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Phase 1 – Pre-Management System Development																										
Task 1.1 - Project Kick-off	■																									
Task 1.2 - Identify working group of experts		■																								
Task 1.3 - Develop Seed Document and Technical Annex			■	■	■																					
Task 1.4 - Recruit SDC members and Chair				■	■																					
Task 1.5 - Provide training support to committee and Chair						■																				
Task 1.6 - Prepare Terms of Reference for SDC						■																				
Phase 2 – Management System Development																										
Task 2.1 – Develop Draft Standard and Technical Annex							▲	■	▲	■	▲	■	▲				▲	■	▲■							
Task 2.2 – Design and implement Public Review Process													■	■	■											
Task 2.3 - Collect, Analyze, and Disposition Public Review Comments																■										
Task 2.4 – Develop ISO New Work Item Proposal																			■							

Work plan	FY 13/14													FY 13/14													
	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Phase 3 – Management System Implementation																											
Task 3.1 – Develop CCAMS Implementation Tools and Processes																				■							
Task 3.2 - Design Pilot Program																											
Task 3.3 - Implement Pilot Program																											
Task 3.3 - Finalize CCAMS and Implementation Tools																											■
Task 3.4 - Develop Standard Maintenance Plan																											■
Project Management and Communications																											
Deliverables ■																											
Technical Committee Meetings ▲																											

PROJECT TEAM

I. CSA Team Structure

CSA Standard Development Committees are typically comprised of a variety of stakeholders. CSA project managers plan, recruit, manage, and engage these multi-stakeholder committees. CSA project managers are responsible for managing the work of Standard Development Committees, strategic steering committees, and advisory councils and ensuring deliverable target dates are met. The proposed Project Team brings together unique knowledge, skills, and expertise in:

- Standards Development;
- International climate change policies, risks, and adaptation methods
- Stakeholder Consultation and Engagement;
- Meeting Facilitation and Consensus Building;
- Project Management;
- Implementation of Standards;
- Education and Training.

J. Project Team Support

All efforts will be made to ensure the individuals assigned to this project will be made available throughout the duration of the project. In the event that an assigned team member becomes unavailable, responsibility for the key services and deliverables will be assigned to a contingency CSA staff member with appropriate skills and experience.

To ensure adequate knowledge transfer, the Project Steering Committee will keep contingency Project Steering Committee Members apprised of the project's status at weekly CSA Project Team meetings. This activity will mitigate the risk of knowledge loss, downtime, and delayed delivery of the required deliverables in the event that an assigned Project Steering Committee Member becomes unavailable.

The CSA Project Steering Committee will be supported by several internal teams, including:

<u>CSA Learning Centre</u>

The CSA Learning Centre, provides adult learning services in a wide variety of technical subject areas, and provides these services to over 6,000 course participants annually. CSA has researched, analyzed, designed, developed, built, and delivered learning products to meet identified market needs for a wide range of industry sectors and user groups.

CSA training programs are recognized by many professional organizations including the Engineering Institute of Canada, Technical Standards and Safety Authority, Registrar Accreditation Board (RABQSA), and the Board of Canadian Registered Safety Professionals. CSA's certified courses are designed to ensure participants will meet the criteria required by certification bodies.

CSA Research and Analysis

CSA's External Affairs department includes research specialists with experience in areas of research that cover a variety of subject areas in support of standardization including new business assessments, competitive intelligence, industry relations, jurisdictional scans, best practice research, gap analysis, and government regulations and policies. The research and analyses completed by CSA research specialists of information has served as strategic input into the development of CSA products (e.g., seed documents) and for specific contract projects.

Member Education

CSA offers Member Education to ensure all committee members are aware of and understand the policies and procedures of the CSA consensus development process. This multi-faceted program includes instructor-led sessions for both committee members and committee chairs, as well as a variety of high quality, flexible e-learning tools.

EXPERIENCE AND QUALIFICATIONS

k. Canadian Standards Association

The Canadian Standards Association (CSA) was established in 1919 and was the first Standards Development Organization in Canada accredited by the Standards Council of Canada (SCC). CSA is an independent, not-for-profit membership association serving business, government and consumers in Canada and the global marketplace with over 2,600 published standards. CSA standards address 54 different technology program areas such as environmental management, quality management, business management, and emergency management.

CSA is a recognized national and international leader in the environmental sector. CSA plays a prominent international role in the management of the International Secretariat for the International Organization for Standardization's (ISO) Technical Committee 207 on Environmental Management (ISO/TC 207). ISO/TC 207 is the "umbrella" committee under which the ISO 14000 series of environmental standards are developed.

CSA is a leading provider of customized standards, guidelines, and information product solutions. CSA's core organizational competencies lie in the areas of:

- **Project Management:** Manage small- to large-scale standardization and advisory projects. Our detailed project methodology enables CSA to manage projects efficiently and effectively and to deliver quality products on time and within budget.
- **Research and Analysis**: Conduct jurisdictional scans, focus groups, and background

research and analysis to feed into document development.

- **Standards and Supplementary Document Development:** Develop consensus and non-consensus standards, guidelines, handbooks, codes of practice, and specifications.
- **Implementation of Standards**: Identify market issues and needs, develop implementation strategies for market application and execution. CSA offers a comprehensive, expert, and customized approach to help solve our partner's needs in the market.
- **Education and Training:** Development and delivery of core and customized education and training services based on CSA standards and guidelines. Understanding of the design requirements for curriculum and experience in designing and delivering accreditation programs that effectively support the learning objectives of students.
- **Stakeholder Engagement:** Design stakeholder engagement processes that serve the clients needs, drawing from our over 9,000 member experts. CSA project managers plan, recruit, manage, and engage these multi-stakeholder groups.
- **Meeting Facilitation and Consensus Building**: CSA project managers are trained and experienced in using proven techniques to build consensus within diverse stakeholder groups. CSA standards are developed using a consensus process.

l. CSA Relevant Products and Services

The qualifications presented below represent a selection of CSA's most relevant products and services. They demonstrate CSA's experience, resources, support, and infrastructure to successfully develop a management system on behalf of the three participating OECS countries.

A Guide to Public Involvement (CSA Z764)

A public-involvement process can be as complex as a national, multi-stakeholder exercise, with fixed deadlines, high stakes, and consensus as a goal. Or it can be as simple as an information-sharing exercise, in which you seek input from people gathered (in person, over the phone, or electronically) to voice and, influence points of view. CSA developed a Guide to help determine whether or not to involve the public in making a decision or dealing with issues. Where public involvement is sought, the Guide assesses appropriate levels of public and stakeholder involvement, taking into consideration project goals, time and budgets available. Other parts of the Guide help plan processes and evaluate results.

CSA Member Training Program

CSA offers a Member Education Program to ensure that all Committee Members are aware of and understand the policies and procedures of the CSA consensus development process.

The goal of CSA's Member Education Program is to ensure that participants in the CSA standards development process clearly understand:

- The policies and procedures which govern the CSA standards development process;
- The implications of involvement in the development process, including the Competition Act;
- The roles and responsibilities of CSA members;
- The rationale for the process relevant to their roles;
- CSA's relationship with the Standards Council of Canada and other international standards bodies as well as our role in the National Standards System.

By educating our members on the process, the results include increased effectiveness in the committee process and greater benefits to our members from their participation.

CSA Curriculum Development

CSA has extensive knowledge of adult education principles and teaching methods and experience in curriculum design, development, and delivery. CSA was involved with the development of international training standards such as ISO 10015, Quality Management – Guidelines for Training

CSA course curriculum and materials are developed based on the Systems Approach to Training, which involves the following stages:

1. Understanding and defining learning objectives;
2. Development of course outlines and lesson plans;
3. Development of training materials and evaluation tools;
4. Delivery of training;
5. Validation.

At each stage, review and verification activities are carried out in consultation with key stakeholders, to ensure that the outputs from each stage meet the specified requirements.

CSA's Learning Centre specializes in adult education principles and teaching methods and curriculum and course material design and development. CSA incorporates teaching methods that promote knowledge transfer and comprehension when designing and developing curriculum (e.g., practical exercises) that will encourage participants to apply previously learned information, analyze information using both simple and complex situations, and evaluate the outputs based on defined criteria. CSA structures curriculum and course materials in a way that re-familiarizes students with basic learning skills and enhances confidence in order to meet the unique needs of adult learners.

CSA 'Smart' Standards Products

CSA 'Smart' Standard products contain features that make it easier for users to understand and apply standards and codes to their day-to-day business. In addition to featuring a searchable and printable version of the applicable standard, users will have access to Smart features that provide quick access to relevant information and helpful tools for the application of the standards such as dynamic hyperlinks, interactive checklists, calculations and animation. Recent Smart Standard releases include the Canadian Electrical Code, Natural Gas and Propane Code, and NRC Building Code with CSA standards. CSA's involvement with this project demonstrates its strengths in product development and management, as well as a proven ability to develop products using leading-edge technology and manage external partners/consultants.

CSA's Electrical Self-Assessment Tool (ESAT)

With roughly 50% of candidates to be Electrical Apprentices failing the Certificate of Qualification Exam (C of Q) per year, CSA undertook the development of an interactive training tool based on the National Occupational Analysis for the Construction Electrician (Red Seal Program) and the 2002 Canadian Electrical Code Part I to support the unique learning needs of this group. The tool is interactive serving up a different set of multiple-choice questions each time the individual takes this practice exam, similar to the format and terminology of the Certificate of Qualification Exam. It also provides students with specific feedback on areas for improvement and refers them directly to the areas of the National Occupational Analysis on which they need to improve. The tool is having a positive impact on the pass rate for individuals taking the C of Q Exam. It is endorsed by both the Canadian Electrical Contractors Association and the International Brotherhood of Electrical Workers.

Research and Analysis for Scoping Paper Development

CSA was contracted by Environment Canada to develop a scoping paper on GHG Verification Team and Verifier Competence. This project included the development of an analytical framework to undertake the research and analysis of existing programs and competency/qualification criteria within different sectors. The analytical framework served as a tool for systematically guiding the research and collecting consistent and comparable data across all jurisdictions (e.g., provinces, countries). The final report included a comparison of data collected from existing programs, analysis of strengths and weaknesses of existing approaches, recommendations based on research, stakeholder consultation, and technical expertise, and rationale for recommendations. The report was prepared in a format that was easy to understand, compare, and present at key stakeholders consultation sessions.

Customer Service for People with Disabilities: Standard Implementation Strategy

The Ontario Ministry of Citizenship contracted CSA to develop an implementation strategy for the CSA B480, Customer Service for People with Disabilities standard. The primary objective of the initiative was to maximize application of the standard in the marketplace, engaging all sectors to increase awareness and change behaviours. The standard was developed to support the Ontarians with Disabilities Act (2001) and the use of voluntary standard and codes. The implementation strategy was developed through research, analysis, and extensive stakeholder consultation. Specific outcomes include a literature survey, development of a discussion paper for use in stakeholder consultation sessions, and the Building Champions pilot program.

Canadian Technology Human Resources Board – National Standards for Technicians and Technologists

CSA developed a strategy for the evolution of the Canadian Technology Standards, which drive the development of curriculum and accreditation of Canada's technicians and technologists. Recommendations were derived from in-depth research on trends and industry best practices and a comprehensive stakeholder consultation inclusive of one-on-one interviews and focus group discussions.

Natural Gas Vehicle Cylinder Inspector Certification Program

CSA's Natural Gas Vehicle Cylinder Inspector Certification Program required the development and maintenance of competency criteria as defined by an expert committee. Learning objectives were developed to guide the provision of appropriate training. To date, over 400 inspectors have passed through this program. CSA is currently expanding its capabilities in this area from the facilitation of consensus-based competency criteria, to the identification of examination methodologies, to establishing jurisdictional agreements, and providing individuals with operations support for related programs in accordance with ISO 17024, General requirements for bodies operating certification of persons.

Drinking Water Quality Management System Standard

CSA managed the development of the provincial Drinking Water Quality Management Standard (DWQMS) for the Ontario Ministry of the Environment, in response to one of the key recommendations from the Part Two Report of the Walkerton Inquiry. This project involved extensive stakeholder consultation from key groups across the province, such as municipal and private operators, public health representatives, and consumer groups. Stakeholder engagement was achieved through the organization and facilitation of six workshops throughout the province. CSA also designed and managed five pilot studies at various municipal drinking water systems in Ontario. The main objective of conducting the

pilot studies was to verify, through field experience, the operational feasibility of the draft DWQMS. 'Lessons learned' from the pilot applications were used to improve the draft DWQMS prior to finalization. CSA also completed a study that identified key components and outlined options for the development of a conformity assessment program for the province's DWQMS.

CSA's Gas Technician Training Materials

In Partnership with TSSA, CSA has developed the Gas Technician Training Materials to prepare trainees to write applicable provincial exams for licensing to work as a natural gas and propane service technician. Each module is developed and reviewed by a panel of technical experts. Course materials are updated regularly to reflect the latest codes and regulations, current technology and industry practices. This training is mandatory is some provinces.

The learning objectives are clearly defined at the beginning of each of the modules of the Gas Tech Training Material. CSA has also developed respective Instructors' packages for each training component. The curriculum contains:

- 31 comprehensive training modules (approximately 3,000 pages of technical content and 1,300 illustration);
- Many example problems and review assignments;
- A foundation of theoretical and practical skills for entry-level gas technicians;
- Preparation for writing applicable provincial exams for licensing to work as a natural gas and propane service technician.

CSA/ IAPA Lift Truck Safety Program

To support the new edition of CSA B335-04, Safety standard for lift trucks CSA has partnered with IAPA (Industrial Accident Prevention Association – a not-for-profit, Ontario–based health and safety organization) to offer an intensive, interactive learning experience designed to provide guidance in the implementation of a tailored workplace lift truck safety program. Emphasis is placed on development of an overall lift truck safety program that effectively addresses personnel training requirements and qualifications of trainers and maintenance personnel.

Technology Early Actions Measures (TEAM) Pre-Qualification Criteria and GHG Quantification Protocol Consultation

CSA developed Qualification Evaluation and Performance Criteria for TEAM SMART Contractors. The scope of work for this assignment included developing an approach and criteria to select contractors in

conformance with the protocol, developing an approach and tool for evaluating contractor statements of qualification, and developing an approach and tool for evaluating the performance of contractors.

CSA also designed, organized, and executed two expert workshops for each sector GHG quantification protocol to discuss and improve draft protocols, designed and implemented an email-based stakeholder input facility to solicit comments on draft protocols, and prepared and delivered a final report for each protocol, including documentation of the protocol development process, stakeholder comments received, disposition of stakeholder comments, recommended approach to finalizing the protocol and remaining minority issues.

CSA's Built Infrastructure Program

CSA has approximately 400 technical and engineering standards that relate to various aspects of Canada's built infrastructure. The content of these standards is developed by suitably qualified technical experts who follow CSA's accredited standards development processes. Presently, CSA's technical subject areas include:

- Buildings – including construction materials, building envelope and structural design, plumbing and mechanical systems, electrical systems
- Bridges and related transportation structures
- Overhead and buried petroleum, gas and electrical distribution networks and systems
- Water and storm water distribution components such as pipes, manholes, etc.

CSA is frequently engaged by municipal stakeholders to become more involved in issues related to urban and rural municipal infrastructure. This includes buried pipes, roads, and other critical infrastructures, and is aimed at addressing issues related to the long-term sustainability of aging municipal infrastructure. In addition to addressing topics related to adapting to the impacts of climate change, other cross-cutting topics are also involved such as: lifecycle analysis and modern municipal asset management. Many of CSA's existing standards are aimed at the design/build phase of infrastructure lifecycles. However, solutions and consideration of other lifecycle phases are growing. This includes phases such as operation and maintenance, repair and rehabilitation as well as divestiture and de-commissioning.

With respect to adapting infrastructure to climate change impacts, CSA staff and some of its members are actively involved with the Public Infrastructure Engineering Vulnerability Committee (PIEVC). This is a three-year initiative under the auspices of the Engineers Canada (formerly known as the Canadian Council of Professional Engineers). Government and industry are both involved.

Part of PIEVC's mandate is to develop and pilot-test a municipal engineering vulnerability assessment protocol. If it becomes appropriate to do so, CSA will assess the feasibility of developing this draft protocol into a national standard for Canada.

PIEVC's draft engineering vulnerability protocol consists of a 5-step process:

1. Project definition whereby boundary conditions are set for a particular infrastructure or class of infrastructure
2. Data gathering and sufficiency assessment is done
3. Qualitative evaluation is conducted
4. Quantitative evaluation is conducted (where required)
5. Recommendations are made

- **COSTS**

Project costs for Phase 1, Phase 2 and Phase 3 will be US$1 million.

Annex 7

Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements

Objectives

To establish the enabling environment whereby households and individuals assume the lead role in building resilient communities by climate proofing critical infrastructure.

Outputs/Outcomes

Key outputs include:

(a) Early warning system established for all vulnerable communities;
(b) Pilot multi-use emergency shelters constructed and to be replicated with support under IDA and other loans;
(c) Critical infrastructure more resilient to climate change risks.

Activities

Component 3 will build climate change resilience in vulnerable communities, including through:

(i) based on lessons learned from the Japanese disaster early warning and community preparedness and response programs, the establishment of ***community early warning and preparedness systems based on real-time hydro-met data*** – see Component 1 (i);
(ii) design, retrofitting/construction of at least three ***pilot multi-use climate resilient and energy efficient emergency shelters*** (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources,
(iii) design and implementation of a ***climate change risk management training program*** for Ministry of Public Works staff to climate proof the design, construction and maintenance of critical infrastructure including roads;
(iv) ***Identification of vulnerable infrastructure***, evaluation of climate change risks and technical solutions to address risks, improve and implement climate proof building codes and develop effective enforcement and monitoring capability to build climate proof structures in the construction industry;
(v) ***Climate proofing of critical infrastructure*** (to be funded under IDA, Regional IDA and possibly IBRD loans) thereby improving access to markets and building climate resilient communities through:
    a. Integration of climate change considerations into national building codes and engineering design criteria;
    b. Construction of *coastal and river defenses* - which are also a tourism product that addresses health and recreational impacts and beach enhancement;
    c. Improved transportation, processing, storage of agricultural/fisheries products and improved access to markets through climate resilient marine transportation infrastructure and associated facilities and services – this activity will build upon earlier studies on risks to marine transportation infrastructure;
    d. Slope stabilization, retrofitting and *climate proofing primary and secondary roads and bridges*;
    e. Retro-fitting (climate proofing) houses, public buildings, and critical infrastructure;
    f. Construction of c*ommunity multi-purpose emergency shelters*;
    g. Effective and climate resilient *waste and waste-water treatment management*;
    h. Improved *climate resilient drainage*;
    i. *Maintenance of storm water drainage*;

j. *Increased water storage and treatment capacity* the latter using renewable energy technologies.

The following priority investments under the SPCR are expected to be co-financed under **IDA** (US$17.5 million loan), **Regional IDA** (Up to US$5.5 million (max) loan), and possibly **IBRD** support (US$20 million loan) in addition to the US$0.5 million (grant) for IDA project preparation activities and US$0.1 million (grant) for Phase 1 PPCR preparation activities:

(a) US$0.6 million (grant) to identify vulnerable infrastructure, evaluate climate change risks and technical solutions to address risks, improve and implement climate proof building codes and develop effective monitoring capability to build climate proof structures in the construction industry.

(b) Climate proofing of critical infrastructure, improving access to markets, and building climate resilient communities through:
- Integration of *climate change considerations into national building codes and engineering design* criteria;
- Construction of *coastal and river defences* - which are also a tourism product that addresses health and recreational impacts and beach enhancement;
- Improved transportation, processing, storage of agricultural/fisheries products and improved access to markets;
- Slope stabilization, retrofitting and *climate proofing primary and secondary roads and bridges*;
- Retro-fitting (climate proofing) houses, public buildings, and critical infrastructure;
- Construction of c*ommunity multi-purpose emergency shelters*;
- Effective and climate resilient *waste and waste-water treatment management*;
- Improved *climate resilient drainage*;
- *Maintenance of storm water drainage*;
- *Increased water storage and treatment capacity* the latter using renewable energy technologies.

Annex 8

Report on Cost Benefit Analysis of Proposed SPCR Interventions[15]

DOMINICA'S PILOT PROJECT ON CLIMATE RESILIENCE (PPCR)

Economics of Adaptation to Climate Change

March 5, 2012

[15] Based on Pre-Second Joint Mission SPCR

1.0 Introduction:

1.1 This study is produced as part of Phase one (1) of a World Bank Consultancy on Pilot Projects on Climate Resilience (PPCR) under the Caribbean Regional Pilot Programme and commissioned by the Government of Dominica.

This paper will contribute to the overall objective of a country driven programme geared to transform national and sectoral planning activities to reduce climate risks and vulnerabilities while addressing critical poverty alleviation and economic development concerns.

1.2 This study is focussed on the economics of adaptation to climate change. Cost benefits analyses of proposed SPCR investments and return and investment analyses are the specific outputs. These are geared to demonstrate the economic value of proposed measures and identify opportunities for sharing any identified residual risks.

1.3 The detailed tasks of the consultancy are as follows:-

I. Review guidelines and background documents of PPCR;

II. Review background materials on PPCR/SPCR and climate change in Dominica, including stocktaking reports, the PPCR Mission Aide Memoire, Dominica's Climate Change Adaptation Policy and Action Plan (2002), Dominica's National Capacity Self Assessment (NCSA) and other relevant documents;

III. Interact with the Ministry of Finance and the Environmental Coordinating Unit (ECU) of the Ministry of Environment, Natural Resources, Physical Planning and Fisheries, the National Climate Change Committee, and other relevant Government Ministries and Agencies ;

IV. Interact with donors supporting climate adaptation programs in Dominica.

2.0 Background:

Like all Small Island Developing States, Dominica is highly vulnerable to the impacts of Climate Change. Dominica is highly dependent on its natural resource base particularly, Agriculture and Fisheries Resources. The essentials infrastructure including transportation and communication infrastructure is located mainly in the coastal areas. The island is prone to natural disasters in particular hurricanes, landslides, flooding, drought and coastal erosion. Further the Country is highly dependent on international trade and highly susceptible to external shocks. The fuel and food import bills constitute a high percentage of the export earnings. The Country is also characterized by poorly designed, constructed and maintained physical infrastructure coupled with limited budget, inadequate human resources, growing poverty levels, high unemployment and limited capacity to mitigate and adapt to the impacts of climate change.

In accordance with the goal of the PPCR, to transform the Country to a climate resilient development pathway; and consistent with national poverty reduction and sustainable development goals and following extensive consultations and through assessments and analyses, Dominica's low carbon climate resilient development strategy was defined.

The key pillars of the strategy were drawn from the Dominica's Medium Term Growth and Social Protection Strategy and framed within the context of Poverty Reduction, Economic Growth, Social Protection and Sustainable Development geared to build capacity for elaboration of a low carbon development pathway and a climate resilient development pathway to transform the local industries and the services sector and to maximize the Country's export potential.

The identified climate resilient development pathway included the following components:-

Component 1: Promotion of Food Security Through Climate Resilient Agricultural/Fisheries Development.

Component 2: Comprehensive Risk Management Framework and Sustainable Climate Change Financing

Component 3: Enhancing Ecosystem/Infrastructure Resilience and Promotion of Human Settlements.

In addition a loan component to provide micro finance and micro insurance to farmers, fisher-folks and vulnerable communities in particular the Kalingo People and women was also determined.

These priority interventions constitute the focus of this study.

3.0 Theoretical/Conceptual Framework:

It is generally accepted that standard cost benefit analyses are not adequate to assess policy options to address climate change. In fact there is a dearth of studies on economic assessments of specific adaptation options to climate change globally. The literature indicates that these models require assumptions that go beyond the usual boundaries of science and economics necessitating judgement calls and complex economic constructs that are largely invisible and inapplicable to policy makers. The climate change issue is fraught with uncertainties of multiple kinds and the long term horizon and inter- generational equity and distributional issues render standard modelling techniques inadequate (Bell and Collan, 2011).

Economics analysis on the impacts of specific adaptation measures must account for the inherent and endogenous risks and uncertainties associated with climate change. The uncertainties with respect to costs and benefits including future damage and avoided costs are quite large and persistent and can compromise the evaluation of the effectiveness of implemented adaptation measures (Caribbean Community Climate Change Center, 2008).

Furthermore, the various assumptions and proxies used to quantify these impacts are subject to great controversy in the literature. These include the following:

- The use of market prices to determine the values for costs and benefits
- The subjectivity of non-market price based methods

- The quantification of non-market costs and benefits
- The irreversibility of some natural phenomena to climate change
- The subjectivity of weights to be assigned
- The selection of the appropriate discount factor

The most celebrated study on the economics of climate adaptation measures was done by Sir Nicholas Stern and entitled the Stern Review. The Stern Review recognised the limitations of economic analyses to addressing climate change problem due to risks and uncertainties over long time periods and the used historic data to estimate future impacts and called for global investments now in the current period to avoid risks and damage in the future. The Review concluded, for example, that the cost of damage from extreme weather alone could be 1% of global GDP by 2100 (Nordhaus, 2007: Dasqupta, 2007).

Adaptation is recognised as critical for vulnerability reduction and to deal with expected impacts of climate change through the building of adaptive capacity to implement the adaptation measures. The costs and benefits of adaptation measures are to be evaluated to determine the viability of the adaptation measure.

The Caribbean Community Climate Change Center (5Cs), recognising the significant gap in the literature relating to climate adaptation studies in the Caribbean region, has commissioned a study on the Implementation of Adaptation Measures to Climate Change Impact and Development of Tools to Evaluate the Economic Effects. The study was completed in 2008 by the Department of Economics of the University of the West Indies, Mona Campus (Caribbean Community climate Change Center, 2008).

This study on the Evaluation of Adaptation Options in Dominica in response to Climate change draws heavily from the referenced study wherein the 5Cs developed a common approach and methodology which can be used throughout the Caribbean to conduct economic analyses of adaptation options to climate change (Bynoe, 2011).

The study also draws from recent economic valuation of protected areas and willingness to pay studies for parks and protected areas conducted in selected Caribbean Countries of the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC).

4.0 Methodology:

The methodology employed in this study was adopted from the methodological approach suggested by the 5Cs which was based largely on work of the Department of Economics of the University of the West Indies, Mona Campus. The first stage of the methodology is to develop a yardstick to make an initial assessment of the social impact of an adaptation measure. This yardstick is to be used by the policy maker to determine whether to pursue that measure given the costs, the anticipated benefits and the perceived risks.

This qualitative approach was suggested based on the lack of studies particularly in developing countries on the economic assessment of specific adaptation measures undertaken in response to climate change. The Intergovernmental Panel on Climate Change (IPCC) confirmed that "the literature on adaptation costs and benefits remains quite limited and fragmented in terms of sectoral and regional coverage" (Adger et al, 2007).

Taking the economic and social characteristic into account and the inherent risks and uncertainties to climate change the Caribbean Community Climate Change Center submitted for possible adoption throughout the Caribbean a decision making framework for policy makers for selecting adaptation options to the impacts of climate change. The framework is based on the evaluation of the costs, the anticipated benefits and the perceived risks of initiating an action or choosing not to initiate an action to different climate scenarios.

4.1 Welfare Realization:

The simplest form of this framework is represented in ***Table 1*** below:-

Table 1: Welfare Realization from Action-Climate Scenario

Action Type	**Climate Unchanged (C_o)**	**Changed Climate (C_1)**
Do nothing *(A_o)*	*W (A_o, C_o)*	*W (A_o, C_1)*
Adapt *(A_1)*	*W (A_1, C_o)*	*W (A_1, C_1)*

Source: Adapted from Stern Review (2006)

The table indicates two policy options (i) Do Nothing (A_0) (ii) Implement the Measure (A^1) and two possible states of the climate (i) Climate Unchanged (C_0) and Changed Climate (C_1) and the welfare of the society resulting from each decision space. Thus the welfare to society when the decision not to implement with an unchanged climate is represented by $W(A_0C_0)$

Thus; the complete matrix is as follows:

W (A_0C_0) welfare when measure not implemented with unchanged climate
W (A_0C_1) welfare when measure not implemented with changed climate

W (A_1C_0) welfare when measure is implemented with unchanged climate

W (A_1C_1) welfare when measure is implemented with changed climate.

By comparing these states in the matrix the relative welfare of each state arising from a policy maker's decision can be evaluated.

Thus W (A_0C_1) – W(A_0C_0) represents welfare gain/loss when no action is taken in a changed climate and

W (A_1C_1) – W (A_0C_0) represents welfare gain/loss for action taken in changed climate.

4.2 Adaptation Decision Matrix:

In the Dominica situation, like the Caribbean as a whole, the direct estimation of welfare called for in the above welfare realization scenario is not practicable and the 5Cs methodology calls for the use of a modified Adaptation Decisions Matrix (ADM) as presented in ***Table 2***.

Table 2: Proposed Adaptation Decision Matrix for Evaluating Adaptation Options

Evaluation Criteria ***(i)***	**Action-Climate Scenario**				
	Relative Weight (ω_i)	**Do Nothing Climate Unchanged** $W(A_o, C_o)$	**Do Nothing Changed Climate** $W(A_o, C_1)$	**Adapt-Climate Unchanged** $W(A_1, C_o)$	**Adapt-Changed Climate** $W(A_1, C_1)$
Include a list of evaluation criteria (say 2-6)	Assigned weights from 0.1 to 1.0	Assigned scores from 1 to 10 on how well each criteria is met under the different action climate scenarios.			
Weighted score	$\sum_i \omega_i W(A,C)$	$\sum_i \omega_i W(A_o,C_0)$	$\sum_i \omega_i W(A_1,C_0)$	$\sum_i \omega_i W(A_1,C_0)$	$\sum_i \omega_i W(A_1,C_1)$

Source: Adapted from Mizina et al. (1999) by Caribbean Community Climate Change Center, 2008.

The modified ADM involves the identification of the climate action scenarios against predetermined evaluation criteria. Scores are assigned say (1-10) to each scenario on how well each evaluation criteria is met. In addition, differential weighting is applied to each criteria to reflect the relative importance of each in the overall evaluation scheme.

The sum of the weighed scores for each scenario is then used as a proxy for the welfare measure as specified in Table 1 and facilitates the calculation of a change in welfare for each decision made within the matrix. The list of criteria will be determined specific to the sector and expert opinion solicited to provide the assigned weights. For example, 0.1 to 1.0 to be assigned using informed judgement based on the relative importance of each criteria in the sector under consideration. Using the sum of the weighted scores the welfare gain from implementing a measure to a changed climate or the welfare loss from failure to implement a measure in a changed climate must be sufficient to justify the implementation of the measure.

4.3 Cost Benefit Analysis:

The second stage in the methodology is to calculate the benefit cost ratio of the proposed adaptation measure. The basic steps proposed are as follows:-

- Itemization the physical, engineering and biological components of each adaptation measure.
- Calculation of resource costs.
- Identification and measurement of outcomes of adaptation options in physical units.
- Conversion of physical outcomes into monetary values.
- Comparison of costs and benefits of the adaptation option (Caribbean Community Climate Change Centre, 2008).

Given that the outcomes maybe tangible and intangible, different valuation techniques will be applied to quantify the costs and benefits. A cost benefit analysis tool including rate of return calculations will then be used to evaluate the adaptation measure.

The equation for calculating the benefits to costs ratios for each adaptation option is as follows:-

$$B\text{-}C = \frac{\sum_{t=0}^{t} \delta^t B_t}{\sum_{t=0}^{t} \delta^t C_t}$$

Where B-C is benefits to costs ratio

B_t is monetary value of benefits of the measure in period

C_t is monetary costs to implement the measure in period t.

δ^t is the discount factor where $\delta = \frac{1}{(1+r)^t}$

The template used for calculating the benefits to costs ratios are attached in Appendix 1

The final stage involves sensitivity analyses based on a range of values for each component for example, changes in discount rate applied and finally the calculation of rates of return and net present values for the selected investments.

5.0 Analysis & Findings:

5.1 Adaptation Measures

The agreed adaptation measures emanating from the SPCR consultancy activities for Dominica's climate resilient development pathway are as follows (*NOTE: the following component activities have been restructured - within the same budget envelope - subsequent to the PPCR Second Joint Mission that was undertaken subsequent to this costs benefit analysis*):-

Component 1: **Promotion of Food Security through Climate Resilient Agricultural/ Fisheries Development**

(a) US$2.5 Million for:

(ii) US$2 million for inventory of surface and ground water resources, water balance assessment, continued monitoring of water resources, hydro-met monitoring stations (including US$800,000 for hydro-met monitoring equipment) to support development of Integrated Coastal and Water Resource Management Plan;

(iii) US$0.5 Million for development of Land Use Capability, Coastal Zone and Water Resource Management Plan and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB) to regulate development in coastal and watershed areas, prevent pollution, regulate the extraction, conservation of water and determine sustainable irrigation levels;

(b) US$1 Million to a food security program (to be implemented in coordination with Component 1 support under Adaptation Fund) involving:

(i) US$0.75 million for the design and construction of a pilot rain-fed organic greenhouse, and organic food processing/storage

facility utilising renewable energy to determine technical and financial viability;

(iii) US$0.25 million for pilot transplanting and restocking of climate resilient corals to determine technical and financial viability with a view to replication in other critical coral reef areas.

Component 2- Comprehensive Risk Management Framework and Sustainable Climate Change Financing- US$2 million for capacity building including:

(a) US$0.5 Million legal establishment and initial (5 year) staffing of the Division of Environment, Climate Change and Development (DECCD)

(b) US$0.2 Million for the design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels;

(c) US$0.2 Million building capacity training program in Ministry of Public Works to climate proof the design and construction of critical roads infrastructure;

(d) US$0.1 Million establishment of the Climate Change Trust Fund;

(e) US$1 Million for the establishment of climate change adaptation standards.

Component 3 – Enhancing ecosystem/infrastructure resilience and promotion of human settlements- US$1.5 million to build climate change resilience in vulnerable communities, including through:

(a) US$ 0.5 Million for community vulnerability mapping and adaptation planning for all Dominica (based on pilot process developed under SLM) which is integrated into National Physical Development (Land Use) Plan being developed with support from CDB;

(b) US$0.5 Million for establishment of community early warning system based on real-time hydro-met data;

(c) US$0.5 Million for design, retrofitting/construction of at least three pilot multi-use climate resilient and energy efficient emergency shelters (one in Kalinago Territory) using appropriate traditional

building methods and renewable energy sources, and build capacity to climate proof access roads to shelter – to serve as basis for building emergency multi-use shelters funded under IDA.

Component 1,2,3- US$4 Million for micro-finance and micro-insurance for farmers, fisher-folk and vulnerable communities, in particular the Kalinago people and women. (40% of funding to be reserved for women, 10% for Kalinago, and 10% for organic farmers).

5.2 Evaluation Criteria

For these adaptation measures proposed, the agreed projects evaluation critieria following consultations with national experts in the respective fields in Dominica were as follows:-

1. Protects the livelihood of the poor
2. Contributes to social capital
3. Protects ecosystems and biodiversity
4. Results in risks reduction
5. Considers intergenerational equity
6. Contributes to growth and development

5.2.1 Procedures Employed:

For the purpose of this analysis each Component will be evaluated as a package. Thus Component 1 on food security while divided in four subprojects will be evaluated as a whole. The implementation time frame as per the SPCR guidelines is 5 years. Thus the physical costs of the SPCR would be spread over 5 years while a 10 year framework would be used to capture additional costs including biological costs and the benefits as a result of the intervention.

Using the ADM approach, expert opinions were solicited from about twenty (20) nationals in the respective fields. Detailed interviews were conducted and the experts were asked based on informed judgement to

assign relative weights to the agreed list of evaluation criteria for each adaptation measure.

The relative weight assigned ranged from 0.1 to 1.0 to reflect the relative importance of each evaluation criteria with respect to the adaptation measures and the overall evaluation scheme.

The experts were then asked to assign relative scores from 1 to 10 for each climate-action scenario on how well the evaluation criteria are met for the respective adaptation measure.

The sum of the weighted scores of each scenario was then calculated and used as a proxy for the welfare measure of each climate-action scenario. By comparing the proxy scores, the decision maker can assess the change in societal welfare for each climate-action scenario. Thus the welfare gain from introducing a measure in a changed or unchanged climate or the failure to introduce the measure can be compared. The policy maker will justify the implementation of the adaptation measure once the relative welfare gain is high and classified as welfare improving. This then paves the way for the cost benefit analysis on the adaptation measure.

5.3 Welfare Analysis

The Modified Adaptation Decision Matrixes for Components 1-4 are represented in the Tables 3 to 6 below.

Table 3: ADM for Component 1

Evaluation Criteria ***(i)***	**Action-Climate Scenario**				
	Relative Weight (w_i)	**Do Nothing Climate Unchanged** $W(A_o, C_o)$	**Do Nothing Changed Climate** $W(A_o, C_1)$	**Adapt-Climate Unchanged** $W(A_1, C_o)$	**Adapt-Changed Climate** $W(A_1, C_1)$
Promotes the livelihood of the poor	1	4	3	8	9
Contributes to social capital	1	3	3	8	9
Protects ecosystem and biodiversity	0.9	2	4	7	8
Results in risks reduction	0.8	3	3	7	7
Considers intergenerational equity	0.8	1	3	6	8
Contributes to growth and development	0.8	2	4	8	9
Weighted score	0.88	13.6	17.6	39.1	44.4

Table 4: ADM for Component 2

Evaluation Criteria ***(i)***	**Action-Climate Scenario**				
	Relative Weight (ω_i)	**Do Nothing Climate Unchanged** $W(A_o, C_o)$	**Do Nothing Changed Climate** $W(A_o, C_1)$	**Adapt-Climate Unchanged** $W(A_1, C_o)$	**Adapt-Changed Climate** $W(A_1, C_1)$
Promotes the livelihood of the poor	1	2	5	10	9
Contributes to social capital	1	4	3	8	10
Protects ecosystem and biodiversity	0.9	3	5	7	10
Results in risks reduction	0.7	3	5	7	9
Considers intergenerational equity	0.5	2	3	4	5
Contributes to growth and development	0.8	1	3	7	10
Weighted score	0.82	12.6	19.9	36.8	44.8

Table 5: ADM for Component 3

Evaluation Criteria ***(i)***	**Action-Climate Scenario**				
	Relative Weight (w_i)	**Do Nothing Climate Unchanged** $W(A_o, C_o)$	**Do Nothing Changed Climate** $W(A_o, C_1)$	**Adapt-Climate Unchanged** $W(A_1, C_o)$	**Adapt-Changed Climate** $W(A_1, C_1)$
Promotes the livelihood of the poor	0.9	2	4	9	7
Contributes to social capital	1	2	3	8	6
Protects ecosystem and biodiversity	0.9	1	3	10	8
Results in risks reduction	0.8	4	2	8	7
Considers intergenerational equity	0.6	4	3	8	7
Contributes to growth and development	0.8	4	3	9	8
Weighted score	0.83	13.5	15.1	43.5	35.7

Table 6: ADM for Component 4 (Loan)

Evaluation Criteria ***(i)***	**Action-Climate Scenario**				
	Relative Weight (ω_i)	**Do Nothing Climate Unchanged** $W(A_o, C_o)$	**Do Nothing Changed Climate** $W(A_o, C_1)$	**Adapt-Climate Unchanged** $W(A_1, C_o)$	**Adapt-Changed Climate** $W(A_1, C_1)$
Promotes the livelihood of the poor	0.9	2	4	9	7
Contributes to social capital	1	2	3	8	6
Results in risk reduction	0.8	4	2	8	7
Contributes to growth and development	0.8	4	3	9	8
Weighted score	0.88	10.2	10.6	29.7	24.3

The ADM for Component 1 was constructed based on the expert opinions of fifteen (15) nationals. The relative scores were tabulated and the mode was used to construct the matrix. The weighted score for each action-climate scenario was then calculated and represented in **Table 3**. The Table shows that the highest relative welfare are attained when the adaptation measure is implemented.

Similarly for Components 2 and 3 represented in **Table 4** and **Table 5** respectively, experts opinions of about twelve (12) nationals were solicited, tabulated and evaluated. The weighted scores for each climate-action as was the case in Component 1 indicate that the highest welfare is for the proactive scenarios of implementation of the adaptation measure.

For Component 4, the loan component, it was agreed to focus on four of the six evaluation criteria. Approximately ten (10) experts were consulted and assigned their relative weights. Again the relative weighted scores call for action to implement the measure.

Table 7: Composite Results of ADM Analysis

Possible Intervention	**Component 1**	**Component 2**	**Component 3**	**Component 4**	**Explanation**
$W(A_o,C_{1-})W(A_0,C_0)$	4	7.3	1.6	0.4	Welfare gain when unprepared to adapt to climate change
$W(A_1,C_1)$-$W(A_0,C_0)$	26.8	24.9	20.6	13.7	Welfare gain when prepared to adapt to a changed climate
$W(A_1,C_0)$-$W(A_0,C_0)$	25.5	24.2	30	19.5	Welfare gain when prepared to adapt and climate remain unchanged

Table 7 summarizes the results of the welfare analyses. For each component the relative welfare gain for implementation whether for a changed or unchanged climate far exceeds the relative welfare gain for non implementation of the adaptation measure.

For example, Component 1 the relative welfare gain is of the order of a six times magnitude increase (proxy measure 4.0 vs. 26.8 or 25.5).

For Component 2 the relative welfare gain for implementation of the measure is 24.9 or 24.2 vs. 7.3 for not implementing the measure.

For Component 3, the order of magnitude is even greater that is, 1.6 vs. 20.6 or 30.0.

In summary therefore the welfare analysis indicates that the society as a whole would be better-off when the adaptation measure is implemented. In all cases the relative welfare gain to society when the adaptation measure is implemented far outweighs the relative welfare gain when the society is not prepared to institute the measure to adapt to climate change.

The welfare analysis reveals therefore the need for institutional support and leadership by the government to enable the capacity and institutionalization of appropriate adaptation strategies. At the same time however, the planned adaptation measures must be aimed at enhancing the adaptative national capacity in the subject sector.

During the consultations it was clear that the specific vulnerabilities of the Country were exacerbated by climate change and that national level action is required while taking into account local conditions, inherent capacities and social, environmental and economic impacts on the targeted communities.

Given that the welfare analyses indicate that society is better off with the implementation of the adaptation measures suggested, specific cost benefit analyses of the adaptation measures were conducted.

5.4 Cost Benefit Analysis:

The methodology employed for the cost benefit analysis encompasses the key elements mentioned in Section 4.3, First, the physical, engineering,

human resource and biological costs of each component of adaptation measures are identified, determined and converted into monetary units.

Second, the physical outcomes and benefits of each component of adaptation measures are identified, determined and converted into monetary units as appropriate.

Third, the appropriate discount rate is then applied to determine the benefit to cost ratios, internal rates of return and net present values of the adaptation measures.

5.4.1 Cost Benefit Analysis of Component 1

The adaptation interventions in Component 1 include interventions in the water sector and the agricultural/fisheries sector. The potential climate impacts in these sectors are as follows:-

- Increased climate variability and changes in temporal and spatial distribution.
- Soil salination
- Changes in surface hydrology
- Contamination of ground water and surface water sources
- Intensified hurricanes activities accompanied by floods and landslides
- Increased sea temperatures
- Ocean acidification and coral bleaching
- Loss of coral reefs
- Loss of biodiveristy
- Ocean sea level rise
- Changes in ocean circulation pattern
- Reduced sector productivity

As a consequence of these climate impacts the specific vulnerabilities of the country will be exacerbated. The agreed adaptation interventions in these sectors are geared to build resilience and enhance the national capacity to address the fallout of these climate impacts.

Cost of Component 1 Adaptation Measures

The key costs centers for Component 1 include the following:-

- Consultancy for inventory and assessment
- Ongoing monitoring of resources
- Procurement of hydro-met equipment
- Ongoing repairs and maintenance
- Consultancy for water resources management plan
- Consultancy for food security programme
- Design and construction of organic green house
- Design and construction of organic food processing/storage facility
- Transplanting and restoring of corals
- Ongoing costs for monitoring/evaluation

In addition to the explicit costs of US$3.5 million provided by the SPCR Grant for this component, a 30% in kind government contribution is assumed. Furthermore, although during the consultations some biological costs of the interventions were identified for the purpose of this analysis these costs are assumed to be zero. The total costs of the implementation of the component are spread primarily based on expert judgements over the 5 year SPCR horizon with residual and ongoing costs spread over the ten year time frame.

Benefits of Component 1 Adaptation Measures

The key benefits of component 1 adaptation measures are as follows:-

- Macroeconomic benefits including employment generation and enhanced foreign exchange earnings

- Enhanced human resources capacity through education and skills training
- Enhanced national databases for informed policy making and project planning
- Avoided costs
- Enhanced productivity and income
- Enhanced social and environmental conditions

It is generally agreed that valuing the benefits of adaptation measures to combat climate change has not been thoroughly developed in the literature. The most dominant approach is a measure of the foregone costs that may arise as a result of implementation of the adaptation measure. This paper assumes the avoided costs approach including compensation paid by government to measure the benefits of the adaptation intervention coupled with any additional benefits and income that may arise. Expert judgements are used to inform the various direct assumptions made.

With respect to Component 1, this paper reviewed the costs to the agricultural/fisheries and water sectors as a result of recent extreme weather related events. The benefits were quantified and spread over the ten year study period.

Finally, the annualized costs and benefits were then discounted by an appropriate discount factor from which the benefits to costs ratios were determined.

As indicated earlier, the choice of discount rate required to convert to a common denominator, the costs and benefits which occurred over time is quite critical to the analysis.

The discount rate used in this study was based on a weighted average method as suggested in the study that was commissioned by the 5Cs. The study argued that "the weighted-average method of discounting with disaggregated domestic and foreign sources of investment funds is a more relevant approach to apply in an economic analysis of climate change adaptation in the Caribbean" (Caribbean Community Climate change Center, 2008).

Using data from the Eastern Caribbean Central Bank the study provided a range of discount rates that can be applied to the Countries of the region after taking into account the specific economic and social circumstances of the Caribbean including the vulnerability to climate change and the limited capacity and budgetary flexibility to finance climate change adaptation measures. The short term horizon for returns on investments also does not auger well for many climate change adaptation measures.

The discount rate applicable to Dominica as per the study ranged from 1.09 to 5.03. This study will utilise this range for each component using the extremities of the range and the midpoint. Thus the social discount rates used are 1.09, 3.06 and 5.03.

Applying the cost benefit methodology indicated, the results indicate that for Component 1 the benefit to costs ratios for each discount rate applied exceed one, thus indicating the financial viability and cost effectiveness of the adaptation option. The internal rates of return and net present values are also positive and significant. Thus for Component 1 the benefits overweighs the cost of the measures and further justifies the adaptation intervention.

Table 8

	Results: Component 1		
	Discount Rates		
	1.09%	3.06%	5.03%
BCR	1.74	1.62	1.50
IRR	17.34%	17.34%	17.34%
NPV	$3,307.64	$2,638.30	$2,071.95

BCR is benefit cost ratio
IRR is national rate of return
NPV is net present value

Component 2:

The adaptation interventions in Component 2 focus on capacity building for a comprehensive risk management framework concentrating primarily on public sector institutional strengthening.

The potential climate impacts relate to the exacerbation of risks and reduced national capacity for sustainable climate financing as a consequence of the impact of climate related weather events. Scarce resources for investments in growth and development are periodically redirected to repair the damage caused by climate related events. Further, the efficiency of resource use for national investments is reduced as a consequence of climate change impacts.

Cost of Component 2 Adaptation Measures:

The key cost centers for Component 2 include the following:-

- Consultancy for legal establishment of the Division of Environment, Climate Change and Development (DECCD)
- Staffing and administrative costs of DECCD
- Consultancy for design education and awareness programme
- Implementation costs for education and awareness programme
- Implementation of capacity building training programme
- Consultancy for and initial set-up of climate change trust funds
- Consultancy for and establishment of the adaptation standards

The explicit cost for this component from the SPCR is US$2 Million. A 30% government contribution is also assumed. These costs were spread based on expert judgements over the ten year period of this analysis.

Benefits of Component 2 Adaptation Measures

The key benefits of Component 2 adaptation measures are as follows:-

- Appropriate legal framework established
- Specialized capacity development including enhanced enforcement capacity
- Education and public awareness programme developed and implemented
- Better informed citizenry on climate change matters

- Reduced disaster risks and reduced vulnerability
- Enhanced resilience of national infrastructure
- Employment generation
- Financing for climate change adaptation measures more readily available
- Reduced dependency on external financing
- Critical standards exist for informed decision making

The avoided cost approach including contribution to the economy was utilized to monetized the benefits based on expert judgement on the likely value added of the adaptation measures of component 2. Application of the cost benefit methodology indicated earlier, shows that this component is cost effective at the various discount rates used. The benefits to cost ratios exceed one and are significant and the internal rates of return and net present values are positive.

Table 9

	Results: Component 2		
	Discount Rates		
	1.09%	3.06%	5.03%
BCR	1.45	1.38	1.31
IRR	17.80%	17.80%	17.80%
NPV	$1,146.00	$910.07	$712.47

Component 3

The adaptation interventions in Component 3 focussed on enhancing ecosystem/infrastructure resilience. The potential climate impacts are loss of biodiversity and ecosystem resilience, infrastructure damage due to intensified weather related activities and sea level rise.

Costs of Component 3 Adaptation Measures

The key costs centers for Component 3 include the following:-

- Implementation of nationwide vulnerability
- Mapping and adaptation planning
- Consultancy for mapping and planning exercise
- Consultancy for and establishment of early warning systems
- Consultancy for designs
- Construction and retrofitting services

The explicit cost for this component from the SPCR is US$1.5 Million. A 30% government contribution is assumed. Like before, the costs were spread based on expert judgements over the ten year period of the analysis.

Benefits of Component 3 Adaptation Measures

The key benefits of Component 3 Adaptation Measures are as follows:-

- Critical data sets determined and available for planning
- Improved communities and nationwide resilience to climate change
- Enhanced and holistic National Physical Development Plan
- Enhanced human resources through training
- Reduced impacts on human settlements and livelihoods
- New and appropriate technologies introduced
- Enhanced efficiency and savings through model replication
- Enhanced resource management and integrity of national sectoral and community budgetary and planning

Like before the avoided cost approach was used to monetized the benefits of Component 3 and the cost benefit methodology applied. In this case however the benefits to costs ratios did not exceed one thus indicating

that this component is not cost effective given the parameters imposed based on the expert judgement. Similar the IRR & NPV indicate that this component is not viable and not justified by these parameters.

Notwithstanding these results, when the timeframe for the cost benefit analyses was extended say from 10 years to 20 years, Component 3 then shows cost effectiveness and financial viability.

This points to the fact that the benefits of climate change adaptation measures may require a medium to long term perspective to realize the full benefits of the investments.

The result CBA results of Component 3 for the 10 year and 20 year time frames are in Table 10 and 11 below.

Table 10 (10 year time frame)

	Results: Component 3		
	Discount Rates		
	1.09%	3.06%	5.03%
BCR	0.73	0.69	0.66
IRR	-9.66%	-9.66%	-9.66%
NPV	-$2,194.66	-$2,344.86	-$2,453.79

Table 11 (20 year time frame)

	Results: Component 3		
	Discount Rates		
	1.09%	3.06%	5.03%
BCR	1.23	1.11	1.00
IRR	-5.09%	-5.09%	-5.09%
NPV	-$2,245.44	-$957.99	-$24.5

5.5 Micro-finance and Micro-insurance:

An allocation of US$4 Million was made through the SPCR for micro-financing and micro-insurance for farmers, fisher folks and vulnerable communities aimed at building resilience and responding to the impacts on livelihoods caused by climate change. It is envisaged that this scheme should have a specific focus on vulnerable groups, administered by an existing national institution at minimal administrative costs and operated as a reimbursable small loan scheme. The terms and conditions of lending are expected to be quite favourable to the targeted sectors and groups. A detailed cost benefit analysis was not completed in this paper, but based on consultation with the experts, it was gleaned that while similar schemes of this nature had mixed successes in the past in terms of overall sustainability, that such a scheme focussing on climate change is needed in Dominica to ease the burden on the most vulnerable in society.

6.0 Conclusion:

The foregoing economic analysis has indicated that to reduce climate risks and vulnerabilities while at the same time addressing socio-economic development concerns require active participation by government to build national capacity to implement climate change adaptation measures.

In fact as stated in the Second National Report 2011, "Planned adaptation measures involve conscious policy options or response measures aimed at altering the adaptive capacity". Thus optimal adaptation approaches must be proactive, inclusive and responsive to the socio-economic demands of the Country.

The level of uncertainty relating to climate impacts together with the current threat faced and experienced by Dominica require the strengthening of the institutional and technical capacities for climate response and to ensure the promotion sustainable and viable investments.

This study shows that the proposed SPCR investments are cost effective, meets the criteria to reduce climate risks and vulnerabilities while at the same time make a positive contribution to the sustainable growth and development of the Dominican economy.

Box 1

The Climate of Dominica

There is evidence to suggest that the climate of Dominica is changing. Both maximum and minimum temperatures have increased in the recent past.

The warming trend is expected to continue. The country is projected to be warmer by up to 1.30 Degrees Celsius by the 2050s, and between 2 and 3 degrees by the end of the century.

Winter months will see marginally larger increases in temperature than summer months.

The frequency of very hot days and nights will increase, while the number of very cool days and nights will decrease.

The country is likely to be drier in the mean. Projections are for up to 20% drier by mid century when models show more consensuses about the trend, and up to 50% drier by 2100.

July-August will likely be drier.

The seasonality of Dominica will be largely unchanged. The cooler (with respect to late season temperatures) dry early months and wet hotter late months will still prevail.

Hurricane intensity is likely to increase (as indicated by stronger peak winds and more rainfall) but not necessarily hurricane frequency.

Caribbean sea levels are projected to rise by up to 0.24 m by mid century.

Sea surface temperatures in the Caribbean are projected to warm, up to approximately 20 Degrees Celsius by the end of the century.

ENSO's impact on Dominican rainfall (early and late season) will likely continue, given projections of the phenomenon's continued occurrence in the future.

Source: Commonwealth of Dominica Second National Communication 2011.

Box 2

Adaptation Policy Framework

Adaptation policies and measures are to be assessed in a developmental context (i.e. they should be complementary to and/or consistent with wider sustainable development efforts such as poverty reduction, environmental protection, economic growth);

Adaptation to short term climate variability and extreme events are explicitly included as a step towards reducing vulnerability to long term climate change;

The Adaptation strategy and the process by which it is achieved are equally important;

Adaptation occurs at various levels within the society including at the local level;

An essential element of response to future climate change is building of capacity to deal with current climate.

Source: Commonwealth of Dominica Second National Communication 2011

Box 3

Characteristics of SIDS

Small Island Developing States have characteristics which make them particularly vulnerable to the effects of climate change, sea level rise and extreme events, including: relative isolation, small land masses, concentrations of population and infrastructure in coastal areas, a limited economic base and dependency on natural resources combines with limited financial, technical and institutional capacity for adaptation.

Source: IPCC (2007) Climate Change 2007: Impacts, Adaptation and Vulnerability.

Caribbean Must Adapt

If the Caribbean Countries fail to adapt, they are likely to take direct and substantial economic hits to their most important industry sectors such as tourism – which depends on the attractiveness of their natural coastal environments – and agriculture (including fisheries) which are highly sensitive sectors and significant losses will not only increase unemployment, but have debilitating social and cultural consequences on communities.

Source: Delal et al (2009). Social Equity Considerations in the Implementation of Caribbean Climate Change Adaptation Policies. Sustainability, 1(3) 363-383.

Box 5

Economic Valuation

It should be stressed that economic valuation has its limits and can only be one input into the decisions process. No method is perfect.

Source: TEEB (2009).

Box 6

Adaption Costs

Adaptation will reduce the negative consequences of climate change and enhance the positive effects but there will usually be some residual damage. Consequently the gross benefit from adaptation is the damage avoided and the net benefits will be the damage avoided minus the costs of adaptation.

Source: Stern Review.

Bibliography:

Belli, P., J.R. Anderson, H.N. Barnum. J.A. Dixon and J.P. Tan (2001). *Economic Analysis of Investment Operations: Analytical Tools and Practical applications*. World Bank Institute, Washington DC 2001.

Bynoe, Mark (2011). "The Methodological Approach to the Review of the Economies of Climate Change Study in the Caribbean", Caribbean Community Climate Change Center, Belize.

Caribbean Community Climate Change Center (2008). "Implementation of Adaptation Measures to Climate Change Impact and Development of Tools to Evaluate Economic Effects." Department of Economics, UWI, Jamaica.

Commonwealth of Dominica (2011). "Second National Communication, Roseau, Dominica.

Dasgupta, Partha (2007). "Commentary: The Stern Review's Economics of Climate Change." *National Economic Review*, vol. 199, pp. 4-7.

Delal et al (2009). Social Equity Considerations in the Implementation fo Caribbean Climate Change Adaptation Policies. *Sustainability*_1 (3) 363-283.

Jones, Eleanor (2011). Review of the Economics of Climate Change: Water Sector Grenada, UNECLAC-CCCCC, Kingston, Jamaica.

Intergovernmental Panel on Climate Change (2001). Climate Change 2001 IPCC Third Assessment Report. Cambridge University Press, Cambridge.

Intergovernmental Panel on Climate Change (1998). The Regional Impacts of Climate Change. Cambridge University Press, Cambridge.

Intergovernmental Panel on Climate Change (2007). Climate Change 2007: Impacts, Adaptation and Vulnerability. Cambridge University Press, Cambridge UK 7-22.

Jenkins, G. And A.C. Harberger (1997). *Cost-Benefit Analysis of Investment Decisions*, Harvard Institute of International Development, Cambridge, MA.

Nordhaus, William D. (2007). " A Review of the Stern Review on the Economics of Climate Change." *Journal of Economic Literature*, vol. XLV (September), pp. 686-702.

Republic of Guyana (2009). "Transforming Guyana's Economy While Combating Climate Change, Georgetown, Guyana.

Sall, Mohamadou et al (2011). "Climate Change Adaptation Strategies and Mobility, Evidence from Four Settlements in Senegal." IIED, November.

Samaniego, Joseluis (2009). Climate Change and Development in Latin America and the Caribbean, UNECLAC, Santiago, Chile.

Simpson, M.C et al (2010). Modelling the Transformational Impacts and Costs of Sea Level rise in the Caribbean, UNDP, Bridgetown, Barbados.

TEEB, (2009). The Economics of Ecosystem and Biodiversity: Climate Issues Update UNEP, Nairobi, Kenya.

TEEB (2009). The Economics of Ecosystem and Biodiversity for National and International Policy Makers -Summary : Responding to the Value of Nature. UNEP Nairobi, Kenya.

UNECLAC, (2009). Economics of Climate Change in Latin America and the Caribbean Santiago, Chile.

Weitzman, Martin L. (2007). "A Review of The Stern Review on the Economics of Climate Change." *Journal of Economic Literature*, vol. XLV (September), pp. 703-724.

World Resources Institute (2011). "The Social Cost of Carbon in US Carbon Policy in Plain English." WRI, Washington DC.

Appendix 1

Results of Cost Benefit Analyses

Spread of Investment Cost('000) for Component 1										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Equipment	800									
Consultancy	1104									
Ongoing Monitoring		24	24	24	24					
Resource Management Plan	500									
Design & Construction of Greenhouse	375	375								
Re-stocking Corals	125	125								
30% In-Kind contribution from Gov't	105	105	105	105	105	105	105	105	105	105
Total Investment Cost	**3009**	**629**	**129**	**129**	**129**	**105**	**105**	**105**	**105**	**105**

Spread of Benefits ('000) for Component 1										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Employment	24	24	24	24	24	24	24	24	24	24
Added Income	24	24	24	24	24	24	24	24	24	24
10% of Avoided Costs (Management Plan)	0	600	600	600	600	600	600	600	600	600
1% of Energy Bill (Utilizing Renewable Energy)	0	0	120	120	120	120	120	120	120	120
1% of Avoided Cost (Climate Resilliant Corals)	0	0	180	180	180	180	180	180	180	180
Total Benefits	**48**	**648**	**948**	**948**	**948**	**948**	**948**	**948**	**948**	**948**

Time(t)	1	
Discount rate ®	**1.09**	
Discount factor (O)	1/ (1+r)^1	1/(1+r)^2
Benefit	B1	
Cost	C1	
Discount benefit	O1 * B1	
Discount Cost	O1 * C1	

Time(t)	1	2	3	4	5	6	7	8	9	10	Total	BCR
Discount rate ®	**1.09%**											
Discount factor (O)	0.989	0.979	0.968	0.958	0.947	0.937	0.927	0.917	0.907	0.897		
Benefit	48.000	648.000	948.000	948.000	948.000	948.000	948.000	948.000	948.000	948.000		**1.744**
Cost	3009.000	629.000	129.000	129.000	129.000	105.000	105.000	105.000	105.000	105.000		
Discount benefit	47.482	634.101	917.664	907.769	897.981	888.299	878.721	869.246	859.874	850.602	7751.740	
Discount Cost	2976.556	615.509	124.872	123.526	122.194	98.388	97.327	96.277	95.239	94.212	4444.098	
Net Benefits	**-2961.000**	**19.000**	**819.000**	**819.000**	**819.000**	**843.000**	**843.000**	**843.000**	**843.000**	**843.000**		

BCR @ 1.09%	**1.744**
IRR	**17.34%**
NPV @1.09	**$3,307.64**
BCR @3.06	**1.618**
IRR	**17.34%**
NPV @ 3.06	**$2,638.30**
BCR @ 5.03	**1.504**
IRR	**17.34%**
NPV @ 5.03	**$2,071.95**

Spread of Investment Cost('000) for Component 2										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Institutional Arrangement	200	75	75	75	75					
Awareness Program	200									
Training Program	100	100								
Trust Fund	100									
Standards	300	300	200	100	100					
30% In-Kind contribution from Gov't	60	60	60	60	60	60	60	60	60	60
Total Investment Cost	**960**	**535**	**335**	**235**	**235**	**60**	**60**	**60**	**60**	**60**

Spread of Benefits ('000) for Component 2										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Employment & Increase Efficiency (1% reduction in NE)	120	120	120	120	120	120	120	120	120	120
Cost Savings	0	24	24	24	24	24	24	24	24	24
Cost Savings	0	0	60	60	60	60	60	60	60	60
Avoided Cost & Efficiency Improvement	200	200	200	200	200	200	200	200	200	200
Total Benefits	**320**	**344**	**404**	**404**	**404**	**404**	**404**	**404**	**404**	**404**

Time(t)	1	
Discount rate ®	**1.09**	
Discount factor (O)	1/ (1+r)^1	1/(1+r)^2
Benefit	B1	
Cost	C1	
Discount benefit	O1 * B1	
Discount Cost	O1 * C1	

Time(t)	1	2	3	4	5	6	7	8	9	10	Total	BCR
Discount rate ®	**1.09%**											
Discount factor (O)	0.989	0.979	0.968	0.958	0.947	0.937	0.927	0.917	0.907	0.897		
Benefit	320.000	344.000	404.000	404.000	404.000	404.000	404.000	404.000	404.000	404.000		**1.455**
Cost	960.000	535.000	335.000	235.000	235.000	60.000	60.000	60.000	60.000	60.000		
Discount benefit	316.550	336.622	391.072	386.855	382.684	378.558	374.476	370.438	366.444	362.493	3666.192	
Discount Cost	949.649	523.525	324.280	225.027	222.601	56.221	55.615	55.016	54.422	53.836	2520.192	
Net Benefits	-640.000	-191.000	69.000	169.000	169.000	344.000	344.000	344.000	344.000	344.000		

BCR @ 1.09%	**1.455**
IRR	**17.80%**
NPV @ 1.09%	**$1,146.00**
BCR @3.06	**1.381**
IRR	**17.80%**
NPV @ 3.06	**$910.07**
BCR @ 5.03	**1.314**
IRR	**17.80%**
NPV @ 5.03	**$712.47**

Spread of Investment Cost('000) for Component 3										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Community Mapping	200	200	100	0	0					
Early Warning System	250	250								
Climate Proofing Infrastructure	1000	1000	1000	1000	1000					
Multi-Use Emergency Center	250	250								
30% In-Kind contribution from Gov't	195	195	195	195	195	195	195	195	195	195
Total Investment Cost	**1895**	**1895**	**1295**	**1195**	**1195**	**195**	**195**	**195**	**195**	**195**

Spread of Benefits ('000) for Component 3										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Employment	240	240	240	120	120	120	120	120	120	120
Avoided Cost (Integrated into Land Use Plan)			600	600	600	600	600	600	600	600
Total Benefits	**240**	**240**	**840**	**720**	**720**	**720**	**720**	**720**	**720**	**720**

Time(t)	1	
Discount rate ®	**1.09**	
Discount factor (O)	1/ (1+r)^1	1/(1+r)^2
Benefit	B1	
Cost	C1	
Discount benefit	O1 * B1	
Discount Cost	O1 * C1	

Time(t)	1	2	3	4	5	6	7	8	9	10	Total	BCR
Discount rate ®	**5.03%**											**0.660**
Discount factor (O)	0.952	0.907	0.863	0.822	0.782	0.745	0.709	0.675	0.643	0.612		
Benefit	240.000	240.000	840.000	720.000	720.000	720.000	720.000	720.000	720.000	720.000		
Cost	1895.000	1895.000	1295.000	1195.000	1195.000	195.000	195.000	195.000	195.000	195.000		
Discount benefit	228.506	217.563	725.002	591.669	563.334	536.355	510.668	486.212	462.927	440.757	4762.992	
Discount Cost	1804.246	1717.839	1117.711	982.007	934.977	145.263	138.306	131.682	125.376	119.372	7216.780	
Net Benefits	-1655.000	-1655.000	-455.000	-475.000	-475.000	525.000	525.000	525.000	525.000	525.000		

BCR @ 1.09%	**0.731**
IRR	**-9.66%**
NPV @ 1.09%	**($2,194.66)**
BCR @ 3.06%	**0.694**
IRR	**-9.66%**
NPV @ 3.06%	**($2,344.86)**
BCR @ 5.03	**0.660**
IRR	**-9.66%**
NPV @ 5.03	**($2,453.79)**

Spread of Investment Cost('000) for Component 3																				
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Community Mapping	200	200	100	0	0															
Early Warning System	250	250																		
Climate Proofing Infrastructure	1000	1000	1000	1000	1000															
Multi-Use Emergency Center	250	250																		
30% In-Kind contribution from Gov't	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195
Total Investment Cost	**1895**	**1895**	**1295**	**1195**	**1195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**

Spread of Benefits ('000) for Component 3																				
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Employment	240	240	240	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Avoided Cost (Integrated into Land Use Plan)			600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
Total Benefits	**240**	**240**	**840**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**

Time(t)	1	
Discount rate ®	**1.09**	
Discount factor (O)	1/ (1+r)^1	1/(1+r)^2
Benefit	B1	
Cost	C1	
Discount benefit	O1 * B1	
Discount Cost	O1 * C1	

Time(t)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	BCR
Discount rate ®	5.03%																					
Discount factor (O)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0		
Benefit	240	240	840	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720		
Cost	1895	1895	1295	1195	1195	195	195	195	195	195	195	195	195	195	195	195	195	195	195	195		1.003
Discount benefit	229	218	725	592	563	536	511	486	463	441	420	400	380	362	345	328	313	298	283	270	8161	
Discount Cost	1804	1718	1118	982	935	145	138	132	125	119	114	108	103	98	93	89	85	81	77	73	8137	
Net Benefits	-1655	-1655	-455	-475	-475	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525		

BCR @ 1.09%	**1.229**
IRR	**5.09%**
NPV @ 1.09%	**$2,245.44**
BCR @ 3.06%	**1.108**
IRR	**5.09%**
NPV @ 3.06%	**$957.99**
BCR @ 5.03	**1.003**
IRR	**5.09%**
NPV @ 5.03	**$24.25**

Annex 9

Project's Preliminary Design and Monitoring Framework (DMF)

Result	Outputs	Outcomes and Outcome Indicators
Enabling environment created for a low carbon, climate resilient development path in Dominica	• Cabinet approved of ***Dominica's Low Carbon Climate Resilient Development Strategy*** demonstrating highest level government commitment to transformational change. • Established legal and institutional framework to facilitate/coordinate climate change and development planning/management. • Government mobilizes resources after 5 year SPCR investments to sustain timely/effective implementation of ***Dominica's Low Carbon Climate Resilient Development Strategy.***	• Increased resilience in economic, social, infrastructural and eco-systems to climate variability and climate change through transformed social and economic development. ***Indicator: Reduced annual budgetary allocation for addressing impacts from climate change and climate variability and corresponding increase in social/economic development spending.*** • Climate change risks formally integrated into national physical planning processes. ***Indicator: 20 local area physical plans and strategies integrating climate resiliency aspects*** • Replication and knowledge sharing of Dominica SPCR lessons learned in non-PPCR CARICOM countries and SIDS ***Indicator; 10 knowledge exchange events attended in the region where Dominica has shared its experiences and lessons learned and 30 national meetings where lessons learned and experiences have been shared with national stakeholders.***

Result	Outputs	Outcomes and Outcome Indicators
Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development	• *Water Resource Inventory* (surface and ground water resources) completed for Dominica and integrated into National Physical Development Plan; • National system of hydro-met and coastal monitoring stations installed; • Early-warning systems established and operational in vulnerable communities; • *Integrated Natural Resource Management Plan* completed and integrated into National Physical Development Plan; • *Dominica`s food security program* developed and funded under Adaptation Fund); • Pilot rain-fed organic greenhouse, drip irrigation, and organic food processing/storage facility established and replicated in vulnerable communities; • Pilot community-based pilot transplanting and restocking of climate resilient corals undertaken and replicated in vulnerable coral reef areas.	• Reduced levels of poverty and improved quality of life of people living in areas most affected by climate variability and climate change; ***Indicator: Reduced levels of poverty in 30 vulnerable communities as recorded in periodic Country Poverty Assessment (CPA)*** • Improved government capacity for assessment and management of Dominica's water supply; ***Indicator: 50 physical planning decisions based on the use of sound hydro-met and coastal data*** • Improved land use planning ***Indicator: 5% increase in agricultural production*** ***5% decrease in water use for irrigation*** ***2% increase in climate resilient coral reef area in project area***

Result	Outputs	Outcomes and Outcome Indicators
Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing	• Government agency responsible for coordinating climate change programming legally established and operational; • Pool of national experts trained in climate change adaptation and disaster risk management under education and awareness program; • community vulnerability maps and adaptation plan developed for all Dominica and integrated into National Physical Development Plan; • *Climate Change Trust Fund* legally established and operational; • Priority private sector and community risk management measures implemented with support from *Climate Change Trust Fund;* • micro-finance and micro-insurance established and providing support to private sector and vulnerable segments of society; • climate change adaptation standards established and in operation for OECS private sector.	• Improved institutional structure and processes to respond to climate variability and climate change. ***Indicator: Cabinet decision adopting legislation to establish government agency coordinating climate change and ensuing passage of legislation through House of Assembly.*** • Dominica vulnerable segments of society more resilient to climate change impacts. ***Indicator: 40 communities mapped as vulnerable and targeted for climate interventions*** ***200% increase in funding for climate-related activities at the community level*** • Dominica less reliant on external support for climate change programming at community level. ***Indicator: 200% increase in financing for climate-related activities at the community level***

Result	Outputs	Outcomes and Outcome Indicators
Component 3 - Enhancing Infrastructure Resilience and Promotion of Sustainable Human Settlements	• Early warning systems and community preparedness programs established and operational in vulnerable communities; • Pilot multi-use climate resilient and energy efficient emergency shelters established and replicated in vulnerable communities; • Ministry of Public Works staff incorporate climate change risk management into day-to-day design, construction and maintenance of critical infrastructure;	• Critical infrastructure more resilient to climate change impacts • Increased level of security for the people of Dominica through risk awareness and access to emergency shelters ***Indicator: 10 emergency shelters established in areas mapped as vulnerable*** ***500% increase in number of communities reached with early warning messages (radio, text messages, TV, other means)*** ***10 staff of Ministry of Public Works (and Ministry of Finance) receiving training on climate-related issues and infrastructure.*** ***5 relevant training courses offered.***

Annex 10

Dominica Strategic Program for Climate Resilience Project/Program Preparation Grant Request			
1. **Country/Region**:	Dominica	2. **CIF Project ID**#:	(Trustee will assign ID)
3. **Project Name:**	Dominica Strategic Program on Climate Resilience (SPCR) - Components 1-3		
4. **Tentative Funding Request (in USD million total) for Project[16] at the time of SPCR submission (concept stage):**	*Grant:*$ 7 million	*Loan* US$9 million	
5. **Preparation Grant Request (in USD million):**	$0.235m	*MDB: World Bank*	
6. **National Project Focal Point**:	Environmental Coordinating Unit (ECU)		
7. **National Implementing Agency (project/program):**	Ministry of Finance Environmental Coordinating Unit (ECU)		
8. **MDB PPCR Focal Point and Project/Program Task Team Leader (TTL)**:	Tiguist Fisseha Latin America and the Caribbean Division,		

9. **Description of activities covered by the preparation grant:**

Dominica is located at 15 degrees North and 61 degrees West, occupying a central position in the eastern Caribbean archipelago. The island is approximately 750.6 square kilometers and is the largest in the Windward and Leeward groups of the Eastern Caribbean.

Dominica is volcanic in origin and is characterized by very rugged and steep terrain with approximately ninety miles of coastline. A chain of mountains extends from the islands center to the south and the topography is characterized by a number of ridges and steep river valleys with gently sloping lands being restricted to narrow coastal strips, particularly in the center and northeast of the island. The islands volcanic natural history remains evident in continuing seismic activity and in scenic attractions such as the Valley of Desolation and the Boiling Lake, which together with dense forests populated with an abundance of natural lakes and waterfalls, provide the basis for a growing eco-tourism industry. Dominica has a forest area of 45 000 hectares –

[16] Including the preparation grant request.

constituting more than half of the island's 75 000 hectare over all land area.

Dominica had a population of approximately 71,000 persons (a decline from 74,750 in 1994), including two thousand Kalinagos, the remaining survivors of the first inhabitants of the island. Topographic conditions have forced human settlements onto narrow coastal areas particularly in the south and west with approximately 44,000 persons (62%) living along the coast. The 2002 Country Poverty Assessment (CPA) found that poverty in Dominica was high by Caribbean standards - around 29% of households and 39% of the population. Around 10% of households and 15% of the population are indigent, i.e. very poor, with poverty being found in both urban and rural areas, although three quarters of poor households live in rural areas where one in every two households is poor.

Dominica, by its very nature is vulnerable, given its susceptibility to natural disasters and its ecological and economic fragility. Vulnerability to climate change in Dominica, like many developing countries, is aggravated by external pressures affecting its resilience and adaptive capacity such as terms of trade, impacts of globalisation (both positive and negative), financial crises, international conflicts, external debt, and internal local conditions such as rapid population growth, incidence of poverty, political instability, unemployment, reduced social cohesion, and a widening gap between poor and rich, together with the interactions between them. It is widely acknowledged that climate change will exacerbate natural disasters with enormous human and economic costs.

Recognising the threats posed by climate change, Dominica has, over the last two decades, undertaken a number of initiatives to respond to this threat. Dominica has established a strong track record on climate change adaptation, and in this regards was one of the few countries chosen to pilot adaptation measures under the *Special Program on Adaptation to Climate Change* (SPACC). Additionally, as a collaborative initiative between the SPACC program and the GEF-funded *Sustainable Land Management* (SLM) project, Dominica has pioneered: (a) the vulnerability mapping and "climate proofing" of National Parks Management Plans; and (b) community-based vulnerability mapping and the development, through community engagement and input, of community adaptation plans.

Dominica has made considerable progress in implementing *Stage 1* adaptation measures. However, the implementation of *Stage 2* and *Stage 3* measures have not been possible due to serious resource (human, technical, financial) constraints. The PPCR *National Adaptive Capacity Assessment* identified *considerable limitations in climate change risk management capacity* at the systematic, institutional and individual levels, at the national, sectoral, district and local level, and within the public sector and civil society, highlighting the *need for considerable capacity building*. The *National Adaptive Capacity Assessment* confirmed the need for improved levels of *earmarked financial resources for climate change risk management and resiliency building* as articulated in the NCSA, and the need for *improved coordination* amongst key state and non state actors involved in climate change risk management.

By addressing the deficiencies identified during the SPCR priority planning process, SPCR interventions will support *the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a low-carbon climate resilience development pathway that can serve as a model for other small island developing States in the region.* By positioning climate change as a development issue rather than an environmental issue, Dominica's SPCR has the opportunity to demonstrate viable interventions to address climate change risks within the context of a national development

framework that establishes the country firmly on the path to a Green Economy.

SPCR interventions will be sustained in the long-term by ensuring that climate change planning/management becomes an *integral part of the national development planning process* under Dominica's *Growth and Social Protection Strategy* (GSPS). In supporting the *transition from government being solely responsible for climate change risk management to a country where this is a shared responsibility*, SPCR interventions have to opportunity to demonstrate a model for transformation changes that could benefit other developing countries. Sustainability will be achieved by establishing *effective partnerships* with all stakeholders (public sector and civil society, technical and financial partners, local governments, vulnerable communities, grass-roots organizations) to transform Dominica to a low-carbon climate resilient country that will make a significant contribution to sustainable development in the country, and add value by ensuring that the SPCR is not a stand alone activity*, but becomes a responsibility assumed by all stakeholders.*

The following priority investments for support under Dominica SPCR were identified:

Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development
The objective of this component is to build climate resilient communities by strengthening capacity to address climate change risks to food security associated with changing precipitation patterns. Component 1 will support the following activities:

(i) Formulation of *Water Resource Inventory* (surface and ground water resources), water balance assessment, continued monitoring of water resources, installation of hydro-met and coastal monitoring stations (including for automatic hydro-met and coastal monitoring equipment) to support establishment of community early-warning systems development (see Component 3 (ii) below) and formulation of *Integrated Natural Resource Management Plan* (see sub-Component ii) that will, inter alia, guide water conservation, extraction and use;

(ii) Development of *Land Use Capability,* and *Integrated Natural Resources Management Plan* and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB) to regulate development in coastal and watershed areas, prevent pollution, regulate the extraction, conservation of water, and determine sustainable irrigation levels.

(iii) Establishment of *food security program* (to be scaled up and replicated with support under Adaptation Fund) involving:

1. design and construction of a pilot rain-fed organic greenhouse, drip irrigation, and organic food processing/storage facility utilizing renewable energy sources to demonstrate technical/financial viability to support scaling up and replication;
2. community-based pilot transplanting and restocking of climate resilient corals to demonstrate technical and financial viability in Dominica with a view to replication in other vulnerable coral reef areas.

Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing. Component 2 will support the following capacity building activities:

(i) financing key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under **Dominica`s Low Carbon Climate Resilient Development Strategy;**

(ii) design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels to be coordinated by the Division of Environment, Climate Change and Development (DECCD);

(iii) community vulnerability mapping and adaptation planning undertaken for all Dominica (based on process piloted under SLM and SPACC projects) and integrated into National Physical Development Plan being developed with support from CDB – see Component 1 (ii);

(iv) legal establishment of *Climate Change Trust Fund* in addition to US$1 million seed funding to the *Climate Change Trust Fund* to provide support to priority community climate change risks management measures identified through community vulnerability mapping and adaptation planning;

(v) establishment of micro-finance and micro-insurance for private sector and vulnerable segments of society (farmers, fisherfolk, women and vulnerable communities in particular the Kalinago people);
(vi) establishment of climate change adaptation standards for the private sector.

Component 3 - Enhancing Infrastructure Resilience and Promotion of Sustainable Human Settlements

The objectives of this component are to establish the enabling environment whereby government, households and individuals assume the lead role in building resilient communities by addressing climate change risks to critical infrastructure. Component 3 will build climate change resilience in vulnerable communities, including through:

(i) establishment of community early warning systems based on real-time hydro-met data – see Component 1 (i);
(iv) design, retrofitting/construction of at least three pilot multi-use climate resilient and energy efficient emergency shelters (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources;
(iv) design and implementation of a climate change risk management training program for Ministry of Public Works staff to climate proof the design, construction and maintenance of critical infrastructure including roads – with infrastructure climate proofing to be funded under IDA, Regional IDA and possibly IBRD loans.

The project preparation grant is needed for conducting technical, economic, financial and social due diligence, and prepare Dominica Technical Assistance (TA) for World Bank Board approval. The major activities of the preparation grant are as follows:

- evaluating technical, economic and financial viability of the interventions:
- conceptualizing the project including the design and monitoring framework including baseline data:
- Liaison with stakeholders to finalise project management and administration framework;
- assessing financial management, procurement, anticorruption measures, policy and legal, capacity, and other institutional issues and mechanisms:
- conducting poverty reduction, gender and social impact assessment; and safeguards assessments (environment, involuntary resettlement, and indigenous peoples):
- preparing procurement and selection criteria for the activities, implementation arrangements and project administration manual;
- Undertaking an assessment of information gaps and development of a knowledge management program;
- Preparing the TA for World Bank Board approval.

10. **Outputs:**	
Deliverable	**Timeline**
Inception Report	Month 1
Mid-term Report Draft Final Report Final Report (TA) for World Bank Board approval)	Month 3 Month 5 Month 6
11. **Budget (indicative):**	
Expenditures[17]	**Amount (USD) –** estimates
Consultants	180,000
Equipment	5,000
Workshops/seminars	20,000
Travel/transportation	10,000
Others (admin costs/operational costs)	5,000
Contingencies (max. 10%)	15,000
Total Cost	**235,000**
Other contributions:	
• Government	
• MDB	
• Private Sector	

12. **Timeframe** (tentative)

Submission of Project Preparation Grant request to PPCR Sub-Committee: May 2012
Expected TA approval by World Bank Board: 28th February 2013

13. **Other Partners involved in project design and implementation**:

The Project Preparatory Technical Assistance (TA) will be implemented through a participatory and consultative approach with ECU and MoF, and other stakeholders including development partners, such as, UNDP, CCCCC, CSA, and bilateral donors. Stakeholder consultation will be a key activity to reach consensus on detailed project design.

[17] These expenditure categories may be adjusted during project preparation according to emerging needs.

14. **If applicable, explanation for why the grant is MDB executed:** Not applicable

15. **Implementation Arrangements** (incl. procurement of goods and services)**:**

ECU combined with the Ministry of Finance (MoF), will be responsible for overall coordination of detailed project preparation, and for overall oversight of TA development. ECU will report to the MoF to provide regular reports on project preparation activities. The PPCR Technical Working Groups (TWG) will provide technical input during project preparation.

All procurement to be financed under the TA will be carried out in accordance with World Bank Procurement Guidelines and consultants will be recruited in line with World Bank Guidelines on the Use of Consultants. Individual consultants will be recruited.

The TA will require 7 months international and 11 months national consulting services. Following is the summary of consulting requirement:

Name of Position	**Person Months**
International –	
Team Leader Climate Change Mainstreaming/Training Specialist	2
Climate Change Risk (Infrastructure) Specialist	1
Coral Reef Restocking Specialist	1
Micro-finance Specialist	1
Micro-insurance Specialist	1
Hydro-Met and Coastal Monitoring Technician	1
National	
Climate Change Specialist	3
Physical Planner	1
Environmental and Gender Analysis Specialist	1
Safeguard Specialist	1
Community Capacity Building Specialist	2
Legal Specialist	1
Project Economist	2

ANNEX 11

Independent Technical Review - Dominica Strategic Program for Climate Resilience

prepared for

Pilot Program for Climate Resilience (PPCR)

by

Maarten van Aalst (mkvaalst@xs4all.nl)

April 5, 2012

Introduction

This external review to the Commonwealth of Dominica's Strategic Program for Climate Resilience (Dominica SPCR) was undertaken in early April 2012, based on desk review of documents (including the strongly related Low Carbon Climate Resilient Development Strategy) and interaction with one of the key consultants that supported the SPCR preparation.

The review follows the structure specified in Annex A of the "Procedures for the preparation of independent technical reviews of PPCR and SREP investment plans and programs", including general criteria (part I), program-specific criteria (part II), and additional recommendations (part III).

Part I: General criteria

The following section comments on whether the Dominica SPCR meets the general criteria indicated in Annex A of the "Procedures for the preparation of independent technical reviews of PPCR and SREP investment plans and programs".

a) The complies with the principles, objectives and criteria of the relevant program as specified in the design documents and programming modalities

The Dominica SPCR is generally consistent with the principles, objectives and criteria of the PPCR.

The SPCR provides a strong package of investments in climate resilience, particularly when seen in combination with parallel investments from the Adaptation Fund, IDA, and possibly IBRD. It addresses both institutional and technical capacity constraints in a range of key sectors and issues of concern. It builds upon significant previous work on adaptation in the country and the region at large.

The policy imperative behind the program is very strong, based on clearly expressed high-level strategies (particularly the Low Carbon Climate Resilient Strategy) and strong political support for the climate agenda.

b) The program takes into account the country capacity to implement the plan

The program is tailored to the country's circumstances, and includes significant elements of institutional strengthening, which should be achievable given the high level of political ownership. Nevertheless, implementation capacity will continue to require strong support and attention, including from the World Bank and UNDP, especially given the very substantial volume of adaptation investments (also beyond the SPCR) that are being planned. In particular, the ability of the Division of Environment, Climate Change

and Development (DECCD) to demonstrate efficiency, value and effective coordination of climate change programming, and the government's commitment to ensure adequate funding, staffing and political support, will be an essential factor in the success of the SPCR and wider adaptation efforts, and should be closely followed and assessed e.g. during the mid-term review of SPCR implementation.

Buy-in and capacity of other actors, including government line agencies, civil society and private sector, will be crucial for the program's success, and merit constant attention during detailed project preparation and implementation.

c) The program has been developed on the basis of sound technical assessments

The technical assessments underpinning the SPCR are generally of sufficient quality, although further work will be needed for the detailed investments, and some gaps will still need to be filled (such as further social and environmental analyses).

The risk assessment methodology provides a good list of priority interventions, but could be sharpened in terms of its approach in dealing with climate change in the context of current variability and extremes (see below).

d) The program demonstrates how it will initiate transformative impact

The SPCR aims to support the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a "low-carbon climate resilient development pathway", seeing climate risk management as a shared responsibility (among public sector and civil society, technical and financial partners, local governments, vulnerable communities and grass-roots organizations) rather than primarily a national government responsibility.

It should be noted that the SPCR's final transformative impact will depend not only on the success of implementation of the investments planned under the SPRC and the related capacity building within government and among other stakeholders, but partly also on a range of planned parallel adaptation investments (Adaptation Fund, IDA, IBRD), which substantially increase the scope of the investments.

e-i) The program provides for prioritization of investments

The SPCR document clearly explains the prioritization process, which included stocktaking, review and analysis; stakeholder climate risk assessments; a national capacity assessment; community surveys; identification of priority needs and investment opportunities during a national workshop; and cost benefit analysis.

The intervention areas are rather broad, but appear to be well-chosen for the range of risks the SPCR identifies and aims to address, particularly given that other investments are expected to support wider roll-out of SPCR supported activities. However, with these parallel investments, the overall volume of adaptation implementation will be very large, requiring strong attention for implementation arrangements. It is noted that without these additional investments, a stronger focus on a more limited set of priorities might have been desirable.

e-ii) The program provides for adequate capturing and dissemination of lessons learned.

The SPCR does not mention much about documenting lessons that will be learned while implementing the program. Given the pilot nature of the PPCR, it will be essential to critically evaluate what works and what doesn't work, and communicate these lessons both within the country and among the wider regional and global community. Part of this role may be fulfilled through the regional SPCR which has

been developed in parallel with Dominica's.

e-iii) The program provides for monitoring and evaluation and links to the results framework

The design and monitoring framework included in annex 10 is in preliminary shape. The success indicators specified for the 3 components are generally at output level, whereas the monitoring and evaluation should also aim to document outcomes. For instance, one set of outcome indicators could address performance/resilience of investment sectors/areas and/or the country at large in the face of near-term climate variability and extremes (actual or simulated). I assume that this will be addressed during detailed project preparation.

f) The program has been proposed with sufficient stakeholder consultation and provides for appropriate stakeholder engagement

The preparations included wide consultations and perspectives of vulnerable communities (including based on previous assessments).

There appears to be scope for further involvement of communities and civil society in program implementation, including for capacity building purposes, which given the nature of some of the investments will undoubtedly be addressed during detailed project preparation.

g) The program adequately addresses social and environmental issues, including gender

The current SPCR document does not contain detailed environmental and social analysis, but a gender and social analysis is included in the Low Carbon Climate Resilient Development Strategy, which forms a compendium part to the SPCR. In particular regarding gender, this Strategy builds on a 2009 UNDP report on "Enhancing Gender Visibility in Disaster Risk Management and Climate Change in the Caribbean - Country Assessment Report for the Commonwealth of Dominica". The Low Carbon Climate Resilient Development Strategy also contains a detailed analysis of climate risks facing the Kalingo / Carib Territory. The SPCR includes several investment priorities identified in these analyses.

Further gender and social impact assessment, as well as safeguards assessments (environment, involuntary resettlement, and indigenous peoples), will be undertaken during detailed project preparation (as listed in Annex 11).

In addition, the SPCR aims to address the country capacity in this area; in particular, environmental impact assessment guidelines, including climate risk assessments, are an explicit program deliverable.

h) The program supports new investments or funding additional to on-going/planned MDB investments

The SPCR is aligned with other adaptation-oriented investments by the Adaptation Fund, IDA and possibly IBRD.

The current program document mentions consultation with a range of other partners (including IDB, CDB, UNDP, UNECLAC, OAS, OECS, CIDA, DFID, JICA) but contains little analysis of regular (not specifically climate-oriented) multilateral or bilateral development investments currently taking place or planned in Dominica. A good analysis of potential synergies with investments in sectors addressed by the SPCR, including potential for mainstreaming of adaptation in those investments, merits further attention during detailed project preparation and implementation.

i) The program takes into account institutional arrangements and coordination

The implementation arrangements depend on a new Council for Environment, Climate Change and Development (CECCD) and Division for Environment, Climate Change and Development (DECCD) (formerly the ECU), which are to be legally established under a proposed Environment, Climate Change and Development Bill, which should be passed in parliament in late 2012. This is clearly a critical condition for SPCR implementation.

It is noted that the DECCD, would initially be staffed with funding provided under the SPCR. It will be important to ensure that these positions are quickly transferred to regular core government budgets to demonstrate ownership and enhance sustainability.

The Ministry of Finance, together with the DECCD, will provide overall monitoring and oversight, ensuring that the SPCR can utilize regular government plannign and implementation processes.

The program builds on capacities in the UN system (especially through UNDP's role in the implementation of component 2) and regional institutions (in particular through the synergies with the regional SPCR).

j) The program promotes poverty reduction

At a policy level, the government considers the Low-Carbon Climate-Resilient Strategy, which was developed together with the SPCR, as a key platform supporting the goals and objectives of its Growth and Social Protection Strategy (GSPS), the country's 5-year strategy for growth and poverty reduction, which is the principal focus of Government's economic and social policy.

The notion of creating an enabling framework that allows communities to better manage their own risks includes targeting especially vulnerable sectors and communities. Several of the investment areas chosen, such as food security, local early warning and shelters, and establishment of a climate trust fund and microfinance initiatives to support local adaptation, will particularly focus on poor and vulnerable communities.

Effectiveness in terms of protection of livelihoods of the poor was one of the key criteria applied in the economic analysis.

k) The program considers cost effectiveness of proposed investments.

The SPCR includes an economic analysis (Annex 9), which addresses the cost effectiveness of proposed investments. It should be noted that this economic analysis is builds heavily on expert judgment, which given the lack of hard data and methodological challenges, is an effective way to quickly prioritize and assess adaptation options (but stops short of a fully scientific analysis).

Part II: Compliance with the investment criteria or business model of the relevant program.

The following section comments on whether the Dominica SPCR complies with the criteria specific for the PPCR, as indicated in Annex A of the "Procedures for the preparation of independent technical reviews of PPCR and SREP investment plans and programs".

a) Climate risk assessment:

The program includes a good assessment of key climate impacts, vulnerabilities and implications (partly also based on previous work).

The risk assessment and intervention prioritization methodology is strongly based on expert judgment by technical working groups, which comprise people with strong local knowledge from a range of technical backgrounds. It provides a good list of priority interventions, but could be framed more sharply in terms of its approach in dealing with climate change in the context of current variability and extremes (and the country's current adaptation deficit). This merits further attention in future capacity building, but has no strong impact on the overall program design, given that the assessment does identify a set of high-priority risks and interventions that are both climate-related and particularly relevant in the context of the current vulnerabilities and the adaptation deficit facing the country.

[As an example, Table 2j provides a Direct Impact Rating Matrix regarding "More severe weather events – Damage to houses, business and other properties due to increased intensity and frequency of hurricane events". The rating of the impacts in the table appears correct, and it is clearly a relevant climate-related risk. However, it is placed here entirely in the context of an increase in risk due to climate *change*, whereas an important part of the hurricane occurrence is determined not so much by a gradual trend, but by natural interannual, ENSO-related as well as deacadal variability (partly somewhat predictable, partly stochastic). Furthermore, to the extent we do have information on climate-related increases in hurricane occurrence, this relates only to the intensity, not the frequency (which will stay the same or decrease).

The probability of this impact is rated as 5 ("Happened often and will happen again during SPCR period"). This is largely the baseline probability, not so much the climate *change* increase, which is not measurable above the statistical noise over a 5-year period Sharper definition of what is and what isn't predictable would **not** have changed the prioritization of investment in overall climate risk management. However, it would help to foster a sharper understanding of whether information on trends needs to be factored in explicitly, or whether adaptation efforts should focus primarily on the adaptation gap to reduce the overall climate risk in the current (and near-future) climate, including better use of climate information on shorter timescales (e.g. based on ENSO patterns) which can often provide more relevant information that can facilitate anticipatory risk management for instance on seasonal timescales.]

b) Institutions/ co-ordination:

The institutional arrangements center around the new Council for Environment, Climate Change and Development (CECCD) and Division of Environment, Climate Change and Development (DECCD), which would be supported through the SPCR. Besides earlier remarks on the key role of this unit, including the desirability of core government financing for it, this is an appropriate arrangement, particularly given the apparently high level of government priority given to the climate agenda.

The private sector aspects of the program require close attention to ensure success, including buy-in from the private sector itself. For instance, the investments in CCAMS include an education and training component, executed by the CSA learning centre. Transfer to in-country training capacity would be desirable, especially since many private sector entities in Dominica that want to implement the standards will require substantial support.

Civil society engagement (including capacity building) merits continued attention during detailed project design, including in terms of the role it may play in continued community engagement.

Engagement with donors has taken place during the Second Joint Mission, and should be continued on a structural basis throughout SPCR implementation, particularly to achieve stronger synergies/mainstreaming with regular development investments.

Engagement with academia will partly happen naturally through the synergies with the SPCR regional track, which includes linkages to a range of knowledge institutions.

c) Prioritization:
Prioritization is underpinned by the participatory risk and options assessments and in the economic analysis. Through use of expert judgment from people with a range of perspectives, these analyses took good account of relevant climate risks and vulnerabilities, development priorities, sectoral policies, and other ongoing policy processes, activities and strategies.

As noted above, the intervention areas are rather broad given the scale of the SPCR financing itself, but will also be supported by other adaptation investments (without these, a stronger focus on a more limited set of priorities might have been desirable; with them, however, special attention will be needed for implementing capacity).

d) Stakeholder engagement/participation
The SPCR workshops have included outreach to a range of stakeholders. Vulnerable groups and communities have been identified by the technical working groups, and based on previous work. For instance, Community Surveys to identify climate change vulnerabilities, capacities and priority needs built upon previous work undertaken under the Sustainable Land Management project and Special Program on Adaptation to Climate Change (SPACC).

Given the nature of several investment components, stakeholder engagement and participation will require continued attention during detailed project design and implementation. As one example, early warning systems do not work unless they are fully trusted by those at risk, and are complemented by an action perspective (including appropriate capacities and resources). Like many adaptation investments, this can only be achieved through a continuous interactive process, not by a one-off design solution. Similar considerations apply to the majority of SPCR investments, from food security investments to private sector standards.

Part III: Recommendations.
This section provides additional recommendations (beyond those mentioned under the formal headings above) that could be considered to further strengthen the program.

One issue that merits further exploration for several components of the SPCF is the use of climate information across timescales, bridging the gap between the real time monitoring and early warning systems (components 1(i) and 3(i)) and the integration of long-term climate information in standards and long-term development planning. This may include liaising with the climate services community, which is being strengthened under efforts to establish a Global Framework for Climate Services, and forums such as the Caribbean Climate Outlook Forum (CariCOF). As an example, this comment also applies to the risk assessment and options prioritization (see the example included in point IIa above).

Other opportunities may lie in synergies with the disaster risk management institutions in the country (disaster management office) and the region, also in light of broader efforts to more strongly integrate disaster risk reduction (supported through GFDRR and in the UN coordinated by UNISDR) and climate change adaptation (see also the recent IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation). Component 2 currently includes a good initiative to strengthen education and awareness raising in this area, and the early warning components 3(i) also

relates to this work, but more ambitious institutional coordination and cooperation merits further attention.

Finally -- a bit beyond the current SPCR design -- I noted that the low-carbon climate-resilient development strategy 2012-2020 states that "*According to the agricultural census (1995) in 1961, at least 95% of private lands in Dominica were categorized as single-owner free-hold. By 1995 this had fallen to just over 65% with an increase in the percentage of lands categorized as "family ownership1" to just under 11%. The census also noted the increase in the quantum of lands classified as "leased", "communal" and "squatter". By 1995 just over 12% of non-state lands fell under these categories. There are no definitive recent statistics to update the situation from the 1995 assessment."*

Given the essential role of such statistics in guiding land use policies and strategies, which have a key role in climate resilience, updating the census might be considered for investment under the SPCR, or to be suggested for parallel investments by the government (possibly in partnership with other donors).

ANNEX 12

Response to PPCR Independent Technical Reviewer Comments on Dominica's *Strategic Program for Climate Resilience*

Name of Independent Technical Reviewer: Maarten van Aalst (mkvaalst@xs4all.nl)

Date of Report: April 5, 2012

The Government of the Commonwealth of Dominica and the World Bank have considered the report of the PPCR Independent Technical Reviewer (Annex 12) on Dominica's ***Strategic Program for Climate Resilience*** (in addition to **Dominica's *Low Carbon Climate Resilient Development Strategy*** that constitutes a compendium first part to the SPCR), and wish to convey their appreciation to the reviewer for the supportive comments and inputs, in addition to the guidance and advice for further development and refinement of these documents. The Government of the Commonwealth of Dominica and the World Bank agree with and support the suggestions made by the PPCR Independent Technical Reviewer that some key issues be addressed during detailed project preparation and SPCR implementation.

The Government of the Commonwealth of Dominica and the World Bank further note the comment made by the Independent Technical Reviewer in his covering note that "*Dominica's SPCR (is) an exciting program - the country appears to be on the brink of a massive (compared to its economy) set of adaptation investments, which if implemented according to plan will have a truly transformative impact on its overall development and climate resilience",* and would like to place on record their response to the following comments made by the PPCR Independent Technical Reviewer.

Reviewers Comments:

- *implementation capacity will continue to require strong support and attention, including from the World Bank and UNDP, especially given the very substantial volume of adaptation investments (also beyond the SPCR) that are being planned. In particular, the ability of the Division of Environment, Climate Change and Development (DECCD) to demonstrate efficiency, value and effective coordination of climate change programming, and the government's commitment to ensure adequate funding, staffing and political support, will be an essential factor in the success of the SPCR and wider adaptation efforts. Buy-in and capacity of other actors, including government line agencies, civil society and private sector, will be crucial for the program's success, and merit constant attention during detailed project preparation and implementation.*

and

- *the overall volume of adaptation implementation will be very large, requiring strong attention for implementation arrangements*.

and

- *It is noted that the DECCD, would initially be staffed with funding provided under the SPCR. It will be important to ensure that these positions are quickly transferred to regular core government budgets to demonstrate ownership and enhance sustainability.*

Response:

Agreed - the following text has been inserted in paragraphs 33 and 36 respectively of the SPCR:

- Dominica's SPCR is to be implemented over a 5 year period (2013 – 2018). SPCR implementation arrangements are outlined in Section 10 of **Dominica's *Low-Carbon Climate-Resilient Development Strategy.***

- Given the very substantial volume of adaptation investments proposed and the additional institutional capacity required to undertake climate change programming, implementation capacity will be closely monitored and assessed periodically throughout SPCR implementation. An assessment of capacity to effectively implement SPCR (and other climate change programming) will be undertaken during the mid-term review of SPCR implementation. This assessment will also verify the adequacy and sustainability of the legal, institutional and financing mechanisms that have been established to implement timely and effective climate change programming in Dominica.

Additionally, the text in Annex 6 has been amended as follows:

Activities
Component 2 will support the following capacity building activities:

(i) financing key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under Dominica`s Low Carbon Climate Resilient Development Strategy. The SPCR technical personnel will compliment staffing of the Division of Environment, Climate Change and Development (DECCD) that is to be legally established under the proposed Environment, Climate Change and Development Bill (see Annex 6 (a) for outline of draft legislation which is currently undergoing public consultation with support under the SLM project in accordance with Cabinet Decision dated the 23rd August 2012) which is to be presented for enactment before the end of 2012. It is proposed that the Environment, Climate Change and Development Bill be enacted prior to SPCR commencement as a demonstration of Government of Dominica's commitment to the establishment of the enabling framework to mainstream climate change into national planning processes. Managing climate change programming is an additional responsibility of the ECU (DECCD), the incremental cost of which – in keeping with agreements under the UNFCCC - should not be a cost borne by resource-stretched developing countries but rather by those industrialized national that have been principally responsible for global climate change. It is anticipated that the Government of Dominica - once the value of improved climate change programming/coordination has been demonstrated during SPCR implementation - will mobilize the necessary resources to ensure continued funding for these positions. Within 3 years of SPCR commencement, the Government of Dominica will have identified and established funding sources (including possible support from the Climate Change Trust Fund established under Component 2 (iv) below) to sustain the operations of the DECCD once SPCR program has been completed.

Reviewers Comments:

- *Technical assessments underpinning the SPCR are generally of sufficient quality, although further work will be needed for the detailed investments, and some gaps will still need to be filled (such as*

further social and environmental analyses). The risk assessment methodology provides a good list of priority interventions, but could be sharpened in terms of its approach in dealing with climate change in the context of current variability and extremes.

and

- *The program includes a good assessment of key climate impacts, vulnerabilities and implications (partly also based on previous work). The risk assessment and intervention prioritization methodology is strongly based on expert judgment by technical working groups, which comprise people with strong local knowledge from a range of technical backgrounds. It provides a good list of priority interventions, but could be framed more sharply in terms of its approach in dealing with climate change in the context of current variability and extremes (and the country's current adaptation deficit). This merits further attention in future capacity building, but has no strong impact on the overall program design, given that the assessment does identify a set of high-priority risks and interventions that are both climate-related and particularly relevant in the context of the current vulnerabilities and the adaptation deficit facing the country.*

Response:

The risk assessments undertaken during SPCR planning process will serve as the foundation for further sector, community and site specific risk analysis during detailed project preparation and community vulnerability mapping to be undertaken during SPCR implementation. Social and environmental analyses are to be undertaken during detailed project preparation.

Reviewers Comments:

- *The SPCR does not mention much about documenting lessons that will be learned while implementing the program. Given the pilot nature of the PPCR, it will be essential to critically evaluate what works and what doesn't work, and communicate these lessons both within the country and among the wider regional and global community. Part of this role may be fulfilled through the regional SPCR which has been developed in parallel with Dominica's.*

Response:

Agreed - the following text has been inserted in paragraph 38:

- SPCR implementation activities will be documented – on SPCR websites maintained by Government of Dominica and CCCCC – for dissemination of best practices and lessons learned to other CARICOM countries, participating PPCR countries, and SIDS. The Government of Dominica will provide periodic reports to the CIF, and also sharing lessons learned with other countries through some CIF instruments such as the CIFNet website, through pilot country meetings, and through regular engagement with other CARICOM countries under the regional track SPCR program. Dominica will also share lessons internally learned during SPCR implementation through periodic workshops and focus group meetings with key stakeholders to take stock of progress.

Reviewers Comments:

- *The success indicators specified for the 3 components are generally at output level, whereas the monitoring and evaluation should also aim to document outcomes. For instance, one set of outcome indicators could address performance/resilience of investment sectors/areas and/or the country at large in the face of near-term climate variability and extremes (actual or simulated). I assume that this will be addressed during detailed project preparation.*

Response:

Agreed – Monitoring and Evaluation outcome indicators have been included in Annex 10. The Government of the Commonwealth of Dominica agrees that some of the more detailed indicators will be addressed during detailed project implementation and will be consistent with the overall PPCR results framework at program level.

Reviewers Comments:

- *Engagement with donors has taken place during the Second Joint Mission, and should be continued on a structural basis throughout SPCR implementation, particularly to achieve stronger synergies/mainstreaming with regular development investments.*

Response:

Agreed - the following text has been inserted in paragraph 37:

- Close institutional coordination and collaboration among relevant development agencies will be an ongoing process to explore and ensure synergies between SPCR and relevant activities during project design, preparation and implementation phases. Additionally, the Government of the Commonwealth of Dominica is committed to continue the close collaboration and engagement with the key stakeholders and civil society that was a key part of the SPCR planning process and consultations during the PPCR National Consultative Workshop and Second Joint Mission.

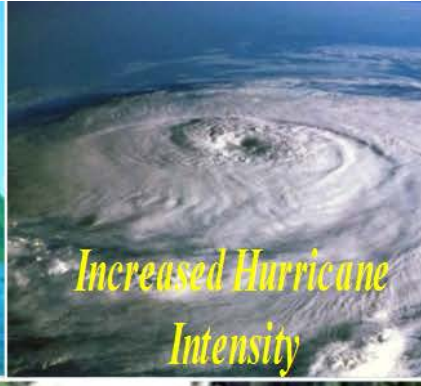
Reviewers Comments:

- *Other opportunities may lie in synergies with the disaster risk management institutions in the country (disaster management office) and the region, also in light of broader efforts to more strongly integrate disaster risk reduction (supported through GFDRR and in the UN coordinated by UNISDR) and climate change adaptation (see also the recent IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation). Component 2 currently includes a good initiative to strengthen education and awareness raising in this area, and the early warning components 3(i) also relates to this work, but more ambitious institutional coordination and cooperation merits further attention.*

Response:

Agreed – strengthening institutional coordination will be a key focus during detailed design of Component 2 institutional strengthening interventions.

CIF Climate Investment Funds



Hydro

DOMINICA

LOW-CARBON CLIMATE-RESILIENT DEVELOPMENT STRATEGY

2012 - 2020

- **"*Unless we fight against climate change, unless we stop this trend, we'll have devastating consequences for humanity.*" United Nations Secretary-General Ban Ki-moon (September 2009).**
- **"*Climate financing is one of the most important aspects of the world's efforts to address the climate change challenge. It is critical to catalysing efforts in developing countries to strengthen climate resilience, curb greenhouse gas emissions and support sustainable development.*" United Nations Secretary-General Ban Ki-Moon *(*November 2010).**
- ***The pace and scale of climate change may now be outstripping even the most sobering predictions of the last IPCC Assessment Report* - Inter-Governmental Panel on Climate Change (IPCC) (2007).**
- **"*The finding by scientists that sea level rise is now expected to be much higher than previously thought (between 0.9 and 1.6 meters by the end of this century) will affect hundreds of millions of people around the world in both rich and poor countries, but it is the poor who will be particularly badly affected. They tend to live in the lowest lying land, and have the fewest resources to adapt.*" Andrew Steer, Special Envoy for Climate Change, WORLD BANK GROUP. (May 4, 2011)**

Report of the Climate Investment Funds (PPCR) Expert Group. January 2009

*It is well-established that the **countries of the Caribbean are among the most vulnerable to global climate change** (IPCC, 1995, 1997, 2001, 2007). While the severity of the impacts will vary from country to country, there is a **suite of priority concerns directly linked to climate change that is virtually ubiquitous across the region**. Sea level rise will combine a number of factors resulting in accelerated coastal erosion, increased flood risk and in some areas permanent loss of land. This may be exacerbated further by any increase in the destructiveness of tropical storms, the impacts of which will be greater due to sea-level rise even without increases in storm intensity. The impacts of sea-level rise will be further exacerbated by the loss of protective coastal systems such as coral reefs. The Caribbean has experienced widespread coral loss in recent decades due to a variety of interacting factors including bleaching, which has become more frequent due to higher ocean surface temperatures, a trend which will continue into the future as a result of climate change (Gardner et al., 2003, 2005; Oxenford et al., 2007). Loss of coral will also affect livelihoods, for example those dependent on tourism and fisheries. Sea-level rise will also be associated with saline intrusion into coastal aquifers, affecting the availability of freshwater, which will combine with drought to increase water stress. The IPCC projections indicate a reduction in precipitation across most of the Caribbean throughout the year, with the largest reductions occurring in the boreal summer (Christensen et al., 2007). Hurricane intensity may increase as a result of anthropogenic climate change, although there is uncertainty about the future behaviour of hurricanes and tropical storms in general (Vecchi et al., 2008).*

Apart from climate-related risks, Caribbean states face similar sustainable development challenges, including limited natural and human resources, fragile ecosystems, proneness to natural hazards, high dependence on imports and a narrow range of economic activities, relatively high population densities and the effects of globalization. Most of the countries are also low-lying, with some coastal areas below mean sea-level (e.g. Guyana, parts of Belize and The Bahamas). In all countries a high percentage of the population and much critical infrastructure are located along the coast. These factors will be exacerbated by the projected adverse effects of climate change.

*No single country emerges as the **most vulnerable in the Caribbean region**. However, the leading candidates would appear to be Guyana, Haiti and **Dominica**.*

Foreword by Prime Minister

Honourable Roosevelt Skerrit
Prime Minister of Commonwealth of Dominica, Minister of Finance

Dominica is susceptible to extremely damaging natural disasters as a result of both its location within the hurricane belt and its geo-physical makeup. These natural disasters have serious potential negative impacts on lower lying areas, slopes and the socio-economic livelihood of populations within them, inclusive on the rich biodiversity.

Dominica's vulnerability to climate change is exacerbated by its present economic performance, its particular socio-economic structure and high concentration of infrastructure along the coastline. The additional stress that climate change places on ecological and socio-economic systems is not to be underestimated. Thus, the energy sector, together with the country's agricultural and water sectors, human settlements and infrastructure, coastal and marine resources have been identified as being, particularly at risk to the potential global climate change impacts.

Climate change is predicted to have severe, if not catastrophic, consequences over the short to medium term across sectors such as, infrastructure, agriculture, energy, human settlements and water, if immediate action is not taken to reduce greenhouse gas (GHG) emissions 50 percent by 2050 from 1990 levels. Global warming will lead to erratic and extreme weather events, floods, droughts, sea-level rise, which could adversely affect food and water supplies, infrastructural development, human health and settlements, and ecosystems and biodiversity.

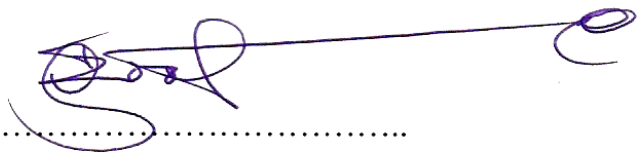
Climate change is clearly the greatest development challenge of the 21st Century. To date, narrowly-defined mitigation and adaptation projects have dominated climate change action policies taken by Dominica. This has resulted in the accumulation of many efforts, isolated in nature, to respond to a crosscutting issue. New and innovative programmatic approaches are necessary to leverage existing experiences and place them into a comprehensive policy framework to support our government in integrating climate and development planning, policies, and action across multiple sectors and levels. In order to meet the challenges and uncertainties of climate change, development processes must be rendered more climate resilient and lower in carbon emissions.

As Dominica embarks on this new and innovative exercise of the formulation and implementation of the Pilot Programme on Climate Resilient (PPCR) and its Strategic Programme on Climate Resilience (SPCR) in pursuit its Low-Carbon Climate-Resilient Development Strategy, we anticipate a programme that will allow us to respond more effectively to climate change. The Low-Carbon Climate-Resilient Development Strategy will not only serve as the programmatic nexus for capturing conventional and innovative sources of sustainable development and climate financing, but should also assist facilitate Dominica's transformation to a climate-resilient economy while implementing, monitoring and building upon existing low-emission climate-resilient development projects and programmes.

The impacts of climate change cut across socio-economic sectors and administrative jurisdictions, and climate mitigation and adaptation actions taken can both jeopardize and facilitate development objectives. This strategy document sets out Dominica's view on how such a platform for partnership can be created, and affirms our commitment to play our part. We should "break the shackles" of current ways of thinking and doing when dealing with climate change and our development partners should take note in this respect. Traditional methods and instruments of funding and development assistance need to be transformed, and the development trajectory reformulated. The importance of a partnership platform bringing together the principal climate stakeholders cannot be overstated and the Government of Dominica stands ready to facilitate this.

The world is running out of time – average global temperatures are rising too fast and our planet is on a trajectory towards human catastrophe of a scale never seen before. The greenhouse gas emissions causing these temperature rises must peak by 2020 and be cut by 80 percent by 2050. It will be impossible to do this without a dramatic reduction in emissions from all sectors. Future generations will not forgive us if we fail to act despite knowing these facts.

I am deeply conscious of the enormous scale of ambition that Dominica's Low-Carbon Climate-Resilient Development Strategy represent. But this global village needs ambition that is commensurate with the challenge we face. I am confident that our Low-Carbon Climate-Resilient Development Strategy will affirm that the people of the Commonwealth of Dominica, "the Nature Isle of the Caribbean" are fully prepared and committed to this worthy enterprise.



……..

Honourable Roosevelt Skerrit

Prime Minister of the Commonwealth of Dominica

Foreword by Minister of Environment, Physical Planning, Natural Resources and Fisheries

Honourable Dr. Kenneth Darroux, Minister of Environment, Natural Resources, Physical Planning and Fisheries

Over the past decade small island developing states have been on the Front Line of climate change – witnessing severe floods, landslides, increased intensity of hurricanes, loss of crops and fishery resources – affecting food security, human health, livelihoods, the economy and our ability to achieve our sustainable development aspirations.

In 2011, the Government of the Commonwealth of Dominica had to respond to flooding and landslides brought upon by unseasonable intense rainfall events – causing in excess of US$100 million in damage. The Commonwealth of Dominica suffered the most severe drought followed by a late Hurricane in 2010. These events combined, present a severe shock to the farming communities which currently employs 25% of the labour force, generating on average 15% of our Gross Domestic product.

While there was considerable uncertainty 20 years ago, today there is substantial body of scientific knowledge highlighting the urgent nature of the problems caused by climate change.

The Government of the Commonwealth of Dominica is reminded of the island's vulnerability to climate change on a regular basis – having to stretch our limited financial resources in order to address the impacts of unseasonable severe weather events. It is a sad reality that Dominica, like many other small island developing States, has to devote an ever increasing portion of our national budgets to restoration and clean up after such storms. Continuous damage to critical infrastructure from climate change continues to affect our competitiveness, our economy and undermines my government commitments to provide for the basic needs of our people.

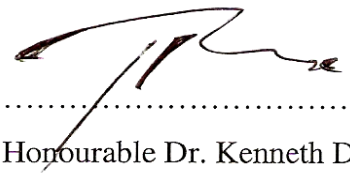
The Commonwealth of Dominica has been fortunate in attracting the help and support from the international community and regional partners in our attempts to manage the

very real risks presented by climate change. In recent years, Dominica has been provided support from the Global Environment Facility to undertake enabling activities that have established the foundation upon which we can begin to manage climate change risks.

Our work to build the Low-Carbon Climate-Resilient Development Pathways have highlighted the fact that funds well in excess of those provided under the Climate Investment Funds and current financing mechanisms under the Convention are required if Dominica is to address climate change in a meaningful manner. Dominica, the Nature Island of the Caribbean with in excess of 60% forest cover, has the potential to continue to be one of the few carbon neutral countries in the world as we today explore the possibilities of harnessing our tremendous geothermal potential.

Our enviable conservation management program has ideally positioned us to be able to explore the possibilities of opportunities and potential benefits which exist under the REDD PLUS program. However, we require access to technical and financial resources to make this a reality.

Despite our many challenges, Dominica continues to demonstrate strong leadership in the area of climate change at the domestic, regional and international levels. It is regrettable, however, that to date, no consensus has been reached on the best way to deal with what we consider a clear and present danger to our planet, and if urgent action is not taken, we will be remembered as the generation who promised so much, but did nothing whilst mother Earth perished.



……..

Honourable Dr. Kenneth Darroux

Minister of Environment, Natural Resources, Physical Planning and Fisheries

Vision and Objectives of the Growth and Social Protection Strategy (GSPS)

Economic growth in Dominica was curtailed in the early years of the 21st century by a conjuncture of unfavourable developments, particularly with respect to trade, but there have been longstanding underlying weaknesses in the economy, in particular its overriding dependence on the banana industry. This absence of economic diversification exacerbated the economy's vulnerability to economic shocks. Inadequate fiscal management led to unsustainable debt levels. This last, which had imperilled prospects for investment and growth, has been addressed successfully by a programme of economic stabilization that included fiscal adjustment and debt restructuring. This programme was supported by an IMF Poverty Reduction and Growth Facility arrangement, and a World Bank Economic Recovery Support Operation. It was also supported by Caribbean countries and institutions as well as other bilateral development partners.

Having stabilized the fiscal situation and made progress towards placing the country on a sustainable debt and growth profile, the clear and present challenge is to continue to build on these gains and place the economy on a path towards sustainable growth, with a view to reducing poverty in Dominica and improving the quality of life of its people. The GSPS represents Government's strategy for dealing with these imperatives in a comprehensive manner.

It is Government's hope that the GSPS will serve its purpose of providing an overarching and strategic perspective on the management of Dominica's economy into the medium term, a perspective that is informed by fiscal and debt parameters and considerations of prudential national economic management. Its development challenges notwithstanding, Government remains committed to: -

> *Leveraging all of the human, natural and financial resources available to the country, in order to realize the vision for Dominica as a place characterized by economic success, and by the much-enhanced quality of life of its people, through their own empowerment, and through policies of Government geared to facilitating an environment within which private enterprise can flourish.*

Government will contribute to ensure that in his or her personal behaviour, a consciousness and pride in our Nature Isle is manifested by every Dominican. It is Government's policy that the Nature Isle will take the lead in enshrining green principles as the guide to our national planning, and to inform initiatives in all sectors.

Government will also be paying attention to the larger environmental issues such as biodiversity, land degradation, climate change and the emission of green house gases that cause global warming. We will give high priority to pursuing policies and programmes that are consistent with well-researched proposals and programmes developed by the international community, and are consistent with our countries' needs and capacities.

Government considers it to be an important part of its mission to lead a process of collaboration with others with a view of preserving the nation's forests, rivers and eco-tourism product, preserving the marine environment and the country's bio-diversity; and popularizing even as preserve the *nature island* concept and brand. These missions include an array of issues including green spaces, garbage disposal and the influence of the nature island brand on construction and other decisions. It is Government's intention to make an active and deliberate contribution to sustainable development of the natural and built-in environment.

Dominica will participate fully in regionally coordinated strategies and policies aimed at mitigating the potentially negative effects of climate change on the economies and ecosystems of Caribbean countries, and will work towards the implementation of the regional framework endorsed by Caricom Heads of Government that aims to make the region more resilient to climate change. As Caribbean sea temperatures rise and is predicted to rise further, coral reefs are being bleached, beaches are eroded by tidal surges as water temperatures warm, sea levels change and weather patterns become less predictable across the year, Caribbean citizens have become sensitized to the impacts of climate change.

Government is fully committed to pursuing this vision for our country. It is committed to pursuing the improvement of the investment environment, and it will work diligently to bring down levels of poverty all over the country.

Dominica's Low-Carbon Climate-Resilient Strategy is a key platform supporting Government's GSPS goals and objectives.

TABLE OF CONTENTS

DOMINICA's *LOW-CARBON CLIMATE-RESILIENT DEVELOPMENT STRATEGY*

Counted amongst the few nations that can be termed "carbon neutral" in light of the country's limited use of fossil fuels (28% of energy from renewable sources) and significant system of protected areas that serve as carbon sinks, the Government of the Commonwealth of Dominica is embarking on a ***Low-Carbon Climate-Resilient Development Strategy*** aimed at facilitating the country's continued transformation to a green economy while ensuring the survival of its productive and export sectors. This Strategy is being implemented in response to continued global economic challenges and the direct effect on Small Island Developing States (SIDS) such as Dominica, which are aggravated by the impacts of climate change. This Strategy will ensure that Dominica, the ***Nature Island of the Caribbean***, will achieve its sustainable development aspirations while meeting critical social development and poverty reduction goals.

부산 세계개발원조총회
4th High Level Forum on Aid Effectiveness
29 Nov –1 Dec 2011, Busan, Korea

Busan Building Block on Climate Change Finance and Development Effectiveness

One of the greatest challenges to sustaining progress on the MDGs and poverty reduction will be strengthening our understanding of the links between responding to climate change and accelerating development. At the moment, a paradigm shift is taking place towards country-driven development that promotes poverty reduction, builds climate resilience and is based on low emissions. To support this country-driven agenda, international public investments – including finance for development and climate – will need to be effectively channeled in support of domestic fiscal frameworks that make the best use of public resources and that create an enabling environment for private-sector driven green growth.

The international community will need to work in true partnership to promote coherent action across different international processes such as that of the High Level Forums on Aid Effectiveness, the UNFCCC COP and Rio +20. Lessons from ODA management suggest that promoting coherence in the ways in which international public finance is delivered is a key to successfully build international support of country driven approaches.

Part I of this Strategy summarizes the country situation including climate change vulnerabilities and risks, and measures taken by the Government of Dominica to address climate change concerns. **Part II** of this Strategy outlines the government's vision and agreed approach in transforming to a low-carbon climate-resilience development pathway, and summarises the proposed program for investments, including activities for finance under the Pilot Program for Climate Resilience (PPCR), the Adaptation Fund, and the Global Environment Facility (GEF).

Part I – Background and Rationale

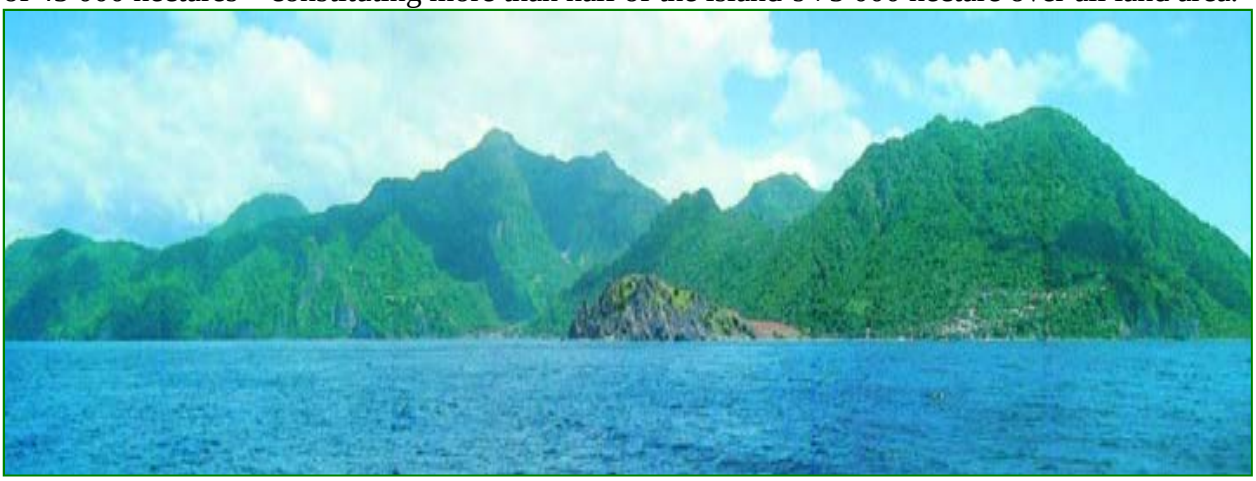
1. Country circumstances

Dominica is located at 15 degrees North and 61 degrees west, occupying a central position in the eastern Caribbean archipelago. The country is bordered by the French territories of Guadeloupe

and Martinique to the north and south respectively. The island is approximately 750.6 square kilometers and is the largest in the Windward and Leeward groups of the Eastern Caribbean.

Figure 1: Map of Dominica

Dominica is volcanic in origin and is characterized by very rugged and steep terrain with approximately ninety miles of coastline. The northern half of the island is dominated by the country's highest summit, Morne Diablotin, which is the highest and largest volcano in Dominica, and the second highest mountain in the Eastern Caribbean, measuring 22 km x 18 km at its base and towering to a height of 1447 meters. A chain of mountains extends from the islands center to the south and the topography is characterized by a number of ridges and steep river valleys with gently sloping lands being restricted to narrow coastal strips, particularly in the center and northeast of the island. The islands volcanic natural history remains evident in continuing seismic activity and in scenic attractions such as the Valley of Desolation and the Boiling Lake, which together with dense forests populated with an abundance of natural lakes and waterfalls, provide the basis for a growing eco-tourism industry. Dominica has a forest area of 45 000 hectares – constituting more than half of the island's 75 000 hectare over all land area.



Dominica has rich volcanic soil and is well served by over 365 streams and rivers. The high mountains and deep ravines are covered in rich tropical forests. Since 1975, an extensive system of national protected areas provides a significant carbon sink and affords protection for approximately 20% of the national territory. Protected areas include one marine park, two large forest reserves (Central and Northern), and the Morne Trois Pitons National Park, a UNESCO World Heritage Site.

2. Climate

Dominica's climate is characterized as tropical maritime with dominant influences being the Atlantic Ocean, the Caribbean Sea, and the northeasterly trade winds. As a result of its mountainous terrain the island possesses a number of micro-climates. Rainfall is distributed between a dry season from December to May and a rainy season from June to November. The western Caribbean coast is in the rain shadow of the various mountain ranges and average rainfall along that coast is significantly less than in interior locations. Dominica's rugged topography results in considerable amount of orographic rainfall making the island susceptible to landslides particularly in mountainous areas.

The island's climate is characterized by consistently warm year-round temperatures with a daytime average of 26-27 degrees Celsius in coastal areas decreasing to 19-21 degrees Celsius in mountainous areas, while night-time temperatures vary from 18-22 Celsius on the coast and 10-12 Celsius at higher elevations.

Rainfall patterns display considerable variability both on annual and locational basis. Nevertheless, Dominica's mountainous terrain makes it the wettest island in the eastern Caribbean with annual rainfall totals exceeding 10,000 mm (400 inches) in some of the higher elevations. The island experiences a dry season between the months of February to June, with November being statistically the wettest month. Relative humidity remains high throughout the year consistently averaging above 85% in mountainous interior areas. Generally rainfall is less on the islands western Leeward coast which, based on the prevailing winds, is within a rain-shadow of the mountainous interior.

The island lies within the Atlantic hurricane belt. Since the late 1970s the island has been affected by a number of hurricanes and tropical storms. In 1979 Hurricane David caused extensive destruction particularly in the southern parts of the island. In 1995, Hurricane Luis also caused wide-spread damage and in August 2007 Hurricane Dean struck the island causing widespread damage to agricultural outputs as well as to road infrastructure estimated at almost 20 percent of GDP (*source IMF*).

3. Development context and climate risks

Dominica was originally populated by Amerindian peoples, known as Kalinago or Caribs, and is the only island in the Caribbean still to possess distinct communities of these indigenous people of the Caribbean. Population estimates for 2011 indicate that Dominica had a population of approximately 71,293

persons (a decline from 74,750 in 1994), including two thousand Kalinago, the remaining survivors of the first inhabitants of the island. Topographic conditions have forced human settlements onto narrow coastal areas particularly in the south and west with approximately 44,000 persons (62%) living along the coast. The largest community is Roseau (the capital city) and its environs with 14,847 persons representing almost 21% of the total population. The 2002 Country Poverty Assessment (CPA) found that poverty in Dominica was high by Caribbean standards - around 29% of households and 39% of the population. Around 10% of households and 15% of the population are indigent, i.e. very poor, with poverty being found in both urban and rural areas, although three quarters of poor households live in rural areas where one in every two households is poor. The remainder (24%) is to be found in the main towns of Roseau and Portsmouth. Poverty amongst the Caribs is much higher: 70% of the Carib population is poor and almost half are indigent. According to a World Bank Report published in 2006, the share of Dominica's population living on less than US$1 a day was below 2 percent. This is considered to be comparatively low (Grenada 4.7%, St. Lucia 2.97%, St. Vincent 5.55%) and the MDG target of halving the proportion of persons living on less than US$1.00 a day by 2015 is expected to be achieved well before that date.

3.1. Economy

The Dominica economy reflects many of the traditional features of a small open economy. This includes a high level of dependence on external trade as a proportion of gross domestic product (GDP), dependence on single sector export products (in this case agriculture) and tourism revenue, high levels of under-employment and unemployment, and dependence on foreign capital (both public and private sector) for investment into productive sectors and for infrastructural development.

The island has always been in a vulnerable position economically, socially, culturally, and environmentally. Economic development, in particular, is significantly affected by both natural and man-made external factors as is increasingly evidenced by the negative impact on the local economy of changes associated with such international phenomenon as globalization and trade liberalization. The dependence of the economy on the constricting banana industry exposes its high economic vulnerability. Attempts to diversify are slow, however recent trends indicate that the island is making progress in its move towards tourism/ecotourism, as it markets its unique environment and culture. In doing so Dominica has become more acutely aware of the need to protect the environment and of the growing threat to its vulnerable natural resources presented by climate change.

The prevailing economic situation over the past five or more years has given rise to sluggish growth and little improvement in the levels of poverty. As such, the present government was compelled to establish a Programme of Economic Stabilization and Recovery in early 2001, which is aimed at, among other things, maintaining fiscal stability and energizing economic growth. The stabilization programme, which imposes stringent austerity measures, is intended to reduce public sector expenditure to sustainable levels in line with required standards set by international agencies such as the International Monetary Fund (IMF) and World Bank (WB). Now in 2012, while still facing significant social and economic challenges, there are indications that Dominica is making steady progress on the road to recovery.

However, the global economic recession continues to affect the country's economy with a 0.3% decline in economic growth being recorded for 2010, a 16% decline in tourist receipts, a 51% reduction in family remittance inflows, and an 18% reduction in foreign direct investment. These declines were partly offset by a 5% increase in agricultural production. External current account deficit currently stands at 28% of GDP, and national debt to GDP ratio now stands at 72 percent, which is a marked improvement from the situation in 2003 when national debts was 130% of GDP. Against this background, the Government of Dominica must continue to find resources to fight poverty in the country.

3.2. Energy and Carbon Footprint

Dominica has no petroleum resources, and energy required to sustain development in the country is imported. Electricity constitutes the primary source of commercial energy for industrial and other uses in Dominica, while approximately 8000 cubic meters of woodfuel are used domestically. The country presently has an installed capacity of 21 megawatts consisting of 6MW (28.5%) of hydropower and 15MW of diesel powered electrical generating units, with annual import costs for fuel to run the diesel powered units continuing to rise, standing at US$18 million in 2010. The main end users of electricity are domestic, commercial and institutional customers and the pattern of consumption demonstrates the low energy use of industry and other non-domestic consumption at this time. The other main source of energy use in Dominica is in the road transport sector. As in most other developing countries road transport consumes an increasing amount of petroleum.

As all other island states and territories in the Caribbean, Dominica is affected by the global crisis caused by the dependency on imported petroleum products with their constantly rising prices. High energy costs, especially for electricity (the highest in the Caribbean), constitute a real development obstacle for numerous sectors, causing an impediment to growth and the achievement of the country's sustainable development.

Hon. Roosevelt Skerrit, Prime Minister, Budget Address. June 29, 2011

The plan is to have our people benefit early from the geothermal energy by installing a small generation plant with an output of 5 megawatts, within the next 3 years to allow for the provision of electricity to the local grid while all the related studies are carried out for the construction and operation of the large scale plant. The intention of the Government is to have a 120MW facility constructed along with a submarine interconnection between Dominica and the islands of Guadeloupe and Martinique. These interconnections will allow the export of electricity to the French islands. The studies for this work are earmarked to begin in the second half of 2011.

Dominica recognises that current high costs associated with importation of fossil fuel-based energy is unsustainable, a draw on the economy, diverts much needed resources from priority poverty reduction and social development programs, and reduces the availability of funds needed to address impacts from climate change and natural disasters.

Table 1 Comparisons of GHG Emissions (Gg) for 1994, 2000 to 2005 (Source Dominica *Second National Communication.* 2011)

	CO_2	CO_2	CH_4	N_2O	NOx	CO	NMVOC	SO_2	HFCs
	Emissions	Removals							
1994	72.8	170	0.968	0.0946	0.432	4.45	2.43	0.105	NA
2000	106	-138	1.57	0.118	0.595	6.32	1.64	0.177	0.0046
2001	118	-137	1.57	0.108	0.676	6.86	3.85	0.213	0.0050
2002	113	-133	1.56	0.101	0.673	7.06	2.77	0.190	0.0017
2003	111	-131	1.55	0.107	0.614	6.13	2.30	0.202	0.0019
2004	111	-130	1.56	0.076	0.577	5.75	3.22	0.186	0.0027
2005	119	-128	1.56	0.097	0.630	6.06	2.30	0.218	0.0030

3.3.Vulnerability Context

Dominica, by its very nature is vulnerable, given its susceptibility to natural disasters and its ecological and economic fragility. Vulnerability to climate change in Dominica, like many developing countries, is aggravated by external pressures affecting its resilience and adaptive capacity such as terms of trade, impacts of globalisation (both positive and negative), financial crises, international conflicts, external debt, and internal local conditions such as rapid population growth, incidence of poverty, political instability, unemployment, reduced social cohesion, and a widening gap between poor and rich, together with the interactions between them. It is widely acknowledged that climate change can exacerbate natural disasters with enormous human and economic costs. The people of the Caribbean region are among the most vulnerable to climate change and related risks and disasters. The impacts of climate change are being seen, yet, an environmentally sustainable approach still remains to be fully mainstreamed into development policy in many countries. Dominica's ***Low Carbon Climate Resilient Strategy*** is intended to address this deficiency.

Climate Change Impacts

Ongoing changes in the earth system due to human-caused greenhouse gas emissions will have profound permanent impacts on the climate. The risks have become increasingly evident as climate science has advanced, though their exact magnitude and incidence is still unclear. Global impacts of climate change, summarised in the most recent assessment by the Intergovernmental Panel on Climate Change (IPCC) include:

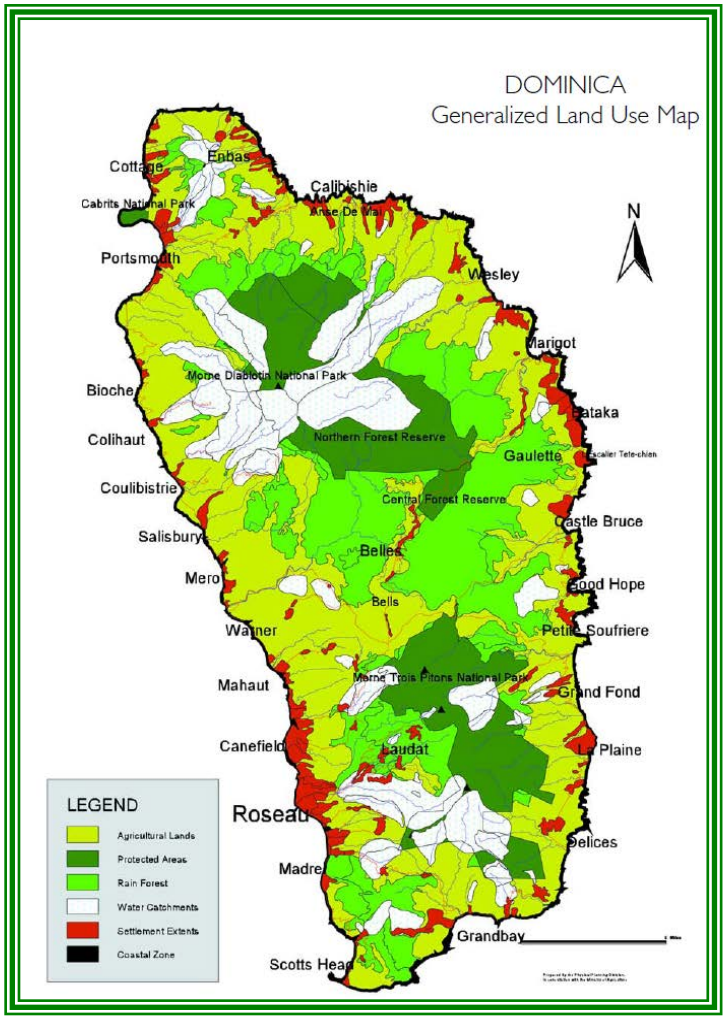
- *Higher temperatures and more frequent and intense heat waves, threatening human life and crops;*
- *More intense rainfall, causing greater flooding;*
- *Reduced crop yields and increasing threats to food security;*
- *Sea level rise; threatening river deltas, coastal cities and small island nations with more storm surges, salinized water and eventual inundation;*
- *More intense hurricanes;*
- *Loss of coral reefs;*
- *Ocean acidification, with possibly profound impacts on marine ecosystems including fisheries;*
- *Loss of terrestrial biodiversity, profound at higher temperatures;*
- *New areas exposed to malaria and other diseases.*

Impacts attributed to climate change in Dominica *are: a change in average climate; sea-level rise; changing distribution of carriers of disease; increased incidence of hot days; changes in rainfall patterns; more acidic oceans (less CO2 dissolved in warmer ocean water); a change in the incidence and intensity of extreme weather events (storm surge; flash floods and tropical hurricanes).*

3.4. Land Use, Protecting Carbon Sinks, and Enhancing the Resilience of Natural Ecosystems

The island is characterized by a very youthful and fragile forest landscape, which makes it very susceptible to the effects of land degradation. However, historically Dominica has a strong tradition of conserving its land resource base. These traditions date back to pre-Columbian times when the forms of land use employed by the indigenous peoples (Kalinago) had very little negative impact on Dominica's physical environment and the land in particular. However, the introduction of plantations and the associated large-scale land clearings by Europeans caused an increased level of soil erosion, especially along the west coast. In the post-World War II period, the banana industry developed, leading to the introduction of heavy machinery to build infrastructure (e.g. roads) together with increased housing needs related to the expanding economy. Thus, significant pressures were brought to bear on the fragile resource base with increasing levels of land degradation and desertification that is now being compounded by impacts from climate change.

The general pattern of land use in Dominica has been dictated by topographic limitations. The highest, most rugged elevations in the interior have remained inaccessible and therefore forest cover - which constitutes Dominica's largest carbon sink - predominates, although there has been gradual loss of forest cover in the lower elevations. The Food and Agriculture Organisation's (FAO) *Country Profiles on Forests, Grasslands and Dry Lands* cites a percentage reduction in forest cover relative to land mass area of 65% to 61% over the period 1990 to 2000., with much of the recorded forest loss being through the sale of State lands and subsequent conversion out of forest cover. Most of these lands were converted to agriculture production and ultimately into housing.

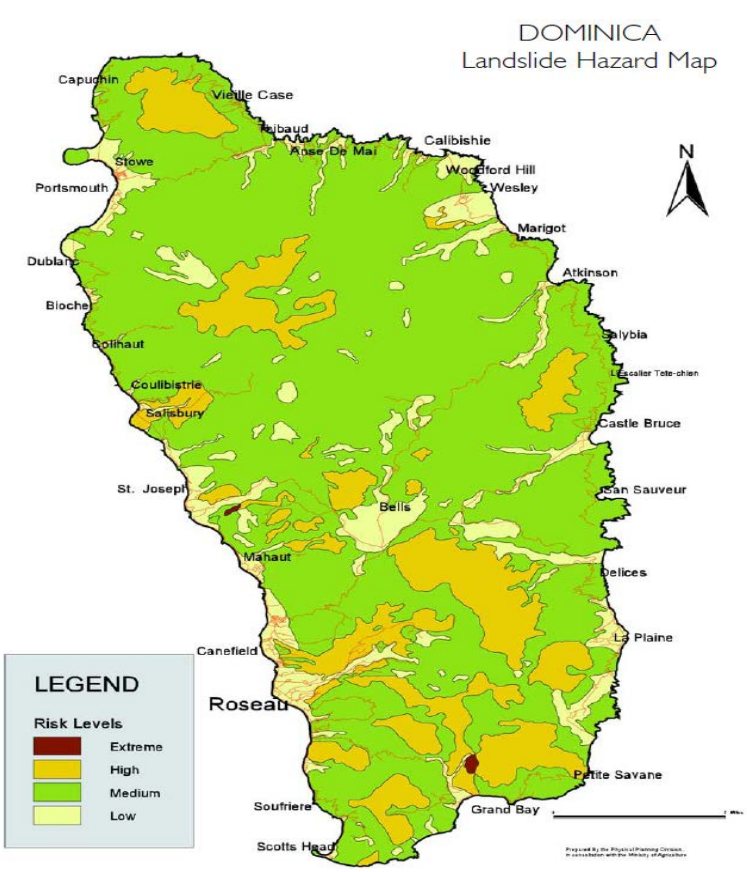


The narrow flat floodplains of the major rivers in the country have seen the most intensive land utilization, predominantly agriculture, with hillside cultivation extending into the mid-elevation areas along road access routes. Banana and temporary (vegetable and root) crops, coconut and citrus dominate commercial agricultural production in Dominica. Urbanization has been largely confined to the narrow coastal fringe,

although newer settlements have been expanding into the interior along the rural road network.

The latter half of the 1990s saw a downturn in the agricultural sector as the banana industry contracted due to the gradual loss of preferential market access to the United Kingdom (driven by World Trade Organization rulings) for Windward Island fruit. Although there has not been a comprehensive national agricultural census since 1995, the Ministry of Agriculture estimates a decrease in the number of farm holdings under active agriculture. Much of the lands that were formerly under banana cultivation are now under short-term cropping systems. Some of the former agricultural lands are now under ***urban development with the threat of accelerated degradation*** due to the high degree of land disturbance, lack of soil and water conservation measures, and increasingly from climate change impacts.

Historically, the majority of the land area in Dominica was parceled into large estates owned by the Crown (mainly unutilized lands in the interior) and private owners (major agricultural estates). As agricultural output from these large estates declined over time the land was subdivided and sold as smaller agricultural parcels and housing lots. From the late 1970's to the mid 1980's, in a major land settlement scheme, the Government acquired 11 private estates totaling 2,368 hectares which were then sub-divided and sold for housing.



The Dominica Agricultural Census of 1995 reported an increase in the number of land parcels classified as farms (from 9,101 to 10,100 from 1961 to 1995), but a decrease in the total acreage under farming systems over that period (from 30,850 hectares in 1961 down to 21,134 hectares in 1995). This trend was due to the transition from large estate agricultural production systems, as these estates were cut up and sold, to more intensive agricultural production on smaller acreages. The expansion in the number of holdings under cultivation corresponded to the rise of the banana industry in Dominica (although on a lesser scale than on the other Windward Islands) from the 1970's into 1990s.

According to the agricultural census (1995) in 1961, at least 95% of private lands in Dominica were categorized as single-owner free-hold. By 1995 this had fallen to just over 65% with an

increase in the percentage of lands categorized as "family ownership[1]" to just under 11%. The census also noted the increase in the quantum of lands classified as "leased", "communal" and "squatter". By 1995 just over 12% of non-state lands fell under these categories. There are no definitive recent statistics to update the situation from the 1995 assessment.

By extension, the transition from larger-scale agriculture to small farms has also had implications for implementation of land conservation measures and efforts to enhance the resilience of natural ecosystems to address climate change concerns. As holdings become smaller, farmers tend to cultivate the full acreage within the holding in short-term crops to maximize financial returns. ***Trees that would otherwise maintain the soil and serve as carbon sinks are often removed resulting in accelerated land degradation in fragile environments***. A compounding factor is that small farmers tend to be resource-poor, with low capacity to invest in soil and water conservation measures. In cases where lands are converted to housing and other forms of urban development, land degradation is driven by similar factors particularly where ***settlements are unplanned and developed without infrastructure to control pollution, runoff, erosion and landslides***. In Dominica, land and water resources degradation has been historically driven mainly by indiscriminate clearing of forests in environmentally fragile areas (steep slopes underlain by erodible soils within high rainfall zones) and subsequent replacement by intensive agricultural cultivation. Installation of poorly constructed farm access roads in these areas in many instances contributes to land degradation. Other activities such as poorly managed mining and quarrying operations and expansion of settlement areas in erosion-prone and landslide-prone areas compounds the country's vulnerability to impacts from climate change. Climate change has both on-site and off-site effects on land. On-site effects include the lowering of the productive capacity of the land, causing either reduced outputs (crop yields, livestock yields) and/or the need for increased inputs. Off-site effects include changes in water regime, such as decline in water quality and sedimentation of river beds and reservoirs, with increased sedimentation rates in rivers being expected in Dominica due to climate change.

These issues translate to a situation in which land that may be otherwise productive, remain under sub-optimal production, with the farmers remaining in a poor subsistence state. In all instances, the resilience of natural ecosystems is undermined, making them increasingly

[1] Family-owned lands are lands with clear individual title; title is often inherited by a collective of heirs of the original owner.

vulnerable to impacts from climate change and natural disasters. Landslides are a constant threat and present a significant impediment to development.

The Government and people of Dominica have for a long time recognised the need to protect the island's fragile ecosystems. By the 1950's the first *Forest Ordinance* was enacted which authorised the establishment of forest reserves on crown lands and protected forests on private land for purposes of soil and water conservation. Since then, a series of laws have been enacted to regulate the use of fragile land resources. These include *inter alia:* the *Town and Country Planning Act*; the *Land Management Authority Act*; the *Forest Reserve Rules*; the *Forestry and Wildlife Act*; the *National Parks and Protected Areas Acts* (over 20% of the island's land mass is under legislated protection); the *Beach Control Act*; the *Water and Sewerage Act* and the *Pesticide Control Act*. Currently, under Cabinet directive issued in August 2011, a comprehensive *Environmental, Climate Change and Development Bill* is being developed through broad-based consultation, which will address key deficiencies in the existing legal and institutional framework, and establish an effective framework for managing anthropogenic threats to vulnerable ecosystems.

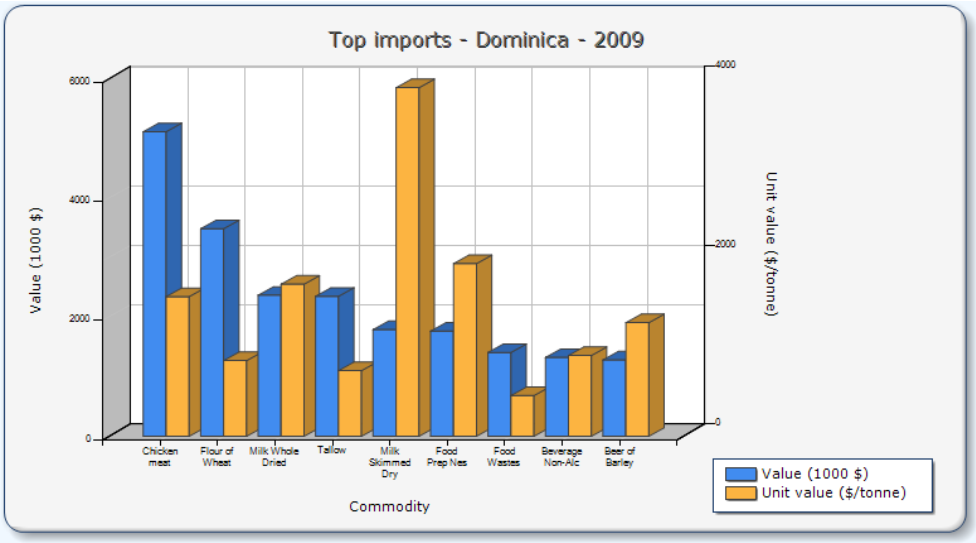
3.5. Agriculture, Fisheries and Food Security

The vulnerability of Dominica's agricultural sector – which together with tourism is the mainstay of the country's economy - is manifested in the risks presented by natural disasters and climate extremes, as well as in the sectors vulnerability to climate variability and external economic shocks. The World Bank points out that Dominica's real agricultural sector product and agriculture's share of GDP has fallen consistently with each major natural disaster with the sector failing to recover to previous levels of relative importance. Most of this decline is attributable to the crop sector, and within that sector, to the decline in banana production. Otherwise there has been significant growth only within the small livestock sub-sector. The World Bank indicate that "the post disaster shift out of agriculture seems to be explained by a combination of a further reduction in larger scale production (failure to invest fully in replacement), a shift of small shareholders into employment in other sectors, and also off-island migration".

Agricultural production accounted for 12.2 per cent of total GDP, and overall the sector is estimated to have declined by 10.6 per cent in 2010 on the heels of a 1.5 per cent growth rate for 2009. The performance of the crops sub-sector was severely affected by the extended drought in 2010. Agriculture's decline has been particularly marked since Hurricane Hugo. Crop sector product in real terms in the late 1990s was 20% below the 1988 peak caused primarily by the decline of the banana industry, which has maintained this pattern during the 2000s.

Agriculture as % of Gross Domestic Product:	12.2
Value of agricultural exports (US$ millions):	16
Share of agricultural exports (% of total exports):	39
Value of agricultural imports (US$ millions):	39
Share of agricultural imports (% of total imports):	21.1

For a country that could be self-sufficient and provide food to neighbouring countries, Dominica's food imports constitute an increasing burden on the economy, and threaten food security. Impacts from climate change, affecting agricultural productivity, continue to aggravate this situation.



Rank	Commodity Imports	Quantity (tonnes)	Flag	Value (1000 $)	Flag	Unit value ($/tonne)
1	Chicken meat	3270	R	5112	R	1563
2	Flour of Wheat	4115	F	3484	F	847
3	Milk Whole Dried	1391	F	2367	F	1702
4	Tallow	3199	R	2350	R	735
5	Milk Skimmed Dry	459	F	1790	F	3900
6	Food Prep Nes	913	F	1764	R	1932
7	Food Wastes	3093	F	1406	F	455
8	Beverage Non-Alc	1463	R	1323	R	904
9	Beer of Barley	1008	F	1281	F	1271
10	Rice Husked	1238	F	1190	F	961
11	Sausages of Pig Meat	418	F	1000	F	2392
12	Bever. Dist.Alc	305	R	997	R	3269
13	Sugar Refined	1615	F	993	F	615
14	Coconut (copra) oil	629	F	945	F	1502
15	Pastry	351	F	929	F	2647
16	Cheese of Whole Cow Milk	164	R	847	R	5165
17	Bread	264	F	778	F	2947
18	Margarine Short	263	R	757	R	2878
19	Turkey meat	492	F	741	F	1506
20	Wine	410	F	721	F	1759

F : FAO estimate
R: Estimated data using trading partners database

Hon. Roosevelt Skerrit, Prime Minister, Budget Address. - June 29, 2011

We will pay close attention to the realities of climate change and so create an (agricultural) sector that is climate smart given our experiences with hurricanes and drought, both of which affected output in 2009/2010. This strategy will ensure food and nutrition security, food safety and the overall competitiveness of the agro-business sector.

With the rapid decline in the major cash crop (bananas), many farmers began moving into the fishing sector, which in 2000 employed 2843 registered fishermen (40% full-time). There is a much greater demand for fish at the present time as a major source of protein. Dominica's fishery resources are relatively diverse including near-shore demersal and pelagic species as well as deep-water pelagics and various crustaceans and other marine species. The Dominica fishing industry is small-scale and of an artisan nature. The fishing fleet has increased from only 913 vessels in 1994 to more than 1100 in 2000, during which time there has been a marked transition from the traditional dugout canoes to the more advanced keelboats and most recently, to the fibre reinforced plastic (FRP) vessels, with vessels ranging in size from 15 - 30 feet. A few of the larger craft have been rigged with tuna longline reels and tackle boxes to accommodate the fishing gear. There are presently 10 tuna longline fishermen (equipped with longline gear) on the island, which target the migratory pelagics during the peak season of August to December, targeting marlin and yellowfin tunas.

There is still a large number of fishing activities involving the use of fish traps which target demersal species. Lobsters are caught for the hotel and tourism industry, while beach seine activities target coastal pelagic species such as sardines and jacks. Gill nets are commonly used to capture schooling species, such as mackerel, ballyhoo and small tunas. There is a closed season for lobster. The only inland fishery presently being practiced is the fresh water prawn (Macrobrachium rosenbergii) culture industry. There are six farmers on the island involved in this industry, which supplies the local market.

All the fish caught is for local consumption. Most fish landed in Dominica is sold directly to the public at landing sites. The damage caused by Hurricane Lenny in 1999 on the Roseau Fisheries Complex was obvious during the following fishing season when there was a marked increase in tuna landings, although the lack of storage facilities posed a major problem, resulting in wastage and loss of revenue by fishermen. Inadequate storage facilities continue to be a significant handicap to fishermen in Dominica. The Fisheries Division has assisted the fishermen by distributing containers to some of the rural landing sites, in order to permit the overnight storage of fish, prior to moving the catch to the Roseau Fisheries Complex the following day.

Fishery commodity balance (2000):

	Production	Imports	Exports	Total supply	Per *caput* supply
	Tonnes live weight equivalent				kg/yr
Fish for direct human consumption	1142	454.8	N/A	1596.8	20.24

Production has considerably increased and fish is more readily available to Dominican consumers. There is a positive correlation between the increased demand for fish and the increase in the number of tourist arrivals to the island, with hotels progressively increasing their quotas. Presentation of under-utilized species in a manner more palatable to the customer has also contributed to the increase in demand from tourism facilities. During the off season, a small number of fish vendors import tuna, marlin and kingfish to supply the local market.

The fishing industry has been faced with considerable challenges, due to the rugged terrain of the Dominican coast, the limited foreshore space, the unsheltered bays and the impact of high-energy waves on the east coast. Development of climate-resilient fisheries infrastructure has therefore been one of the Fisheries Division's greatest priorities. The two proposed fisheries complexes at Marigot and Portsmouth will serve as regional facilities to accommodate fishermen from the various neighbouring landing sites, and will also serve as hurricane shelters/dry docking facilities for fisher folk. The fisheries sector, due to its vulnerability to hurricanes, is continuously trying to recover from the damages caused by these storms, with government contributions to the fisheries sector after Hurricane Omar exceeding US$1.6 million to compensate for lost fishing boats and equipment, and losses totaling in excess of US$2 million for 2011. The Division intends to establish a disaster relief fund with funding provided under the Pilot Program for Climate Resilience (PPCR) to which fishermen will contribute and which would help support recovery costs.

Already fishery resources face considerable stresses from a number of land based sources of pollution. Existing climate stresses especially hurricane/tropical storm systems and warming oceans present important challenges for the health and sustainability of the ecosystems that sustain the islands fisheries. Climate change, including increasing ocean acidification and changes in sea temperatures, are affecting fishery resources and migration patterns with consequent impacts on the sustainability of Dominica’s fishery sector, livelihoods, human health and prospects for food security. Climate change impacts on Dominica’s vibrant diving and whale-watching industry are yet to be determined.

3.6. Enhancing the Resilience of Water Resources

The vulnerability of water resources is a major concern. A number of challenges already face development and management of water resources in the Dominica, which depends on its abundance of rivers for its water supply and to sustain agricultural productivity. Freshwater resources are already under stress as a result of pollution from land-based activities such as agriculture and industry, combined with seasonal changes in flow from climate variability. The development of the water sector is capital intensive with the supply of water being regarded as an essential social service rather than as a profit centre. Additionally, topographical constraints, limited finances, and other limitations have resulted in small, individualized water storage systems which are costly to manage and maintain. Additionally, small population centers separated by extremely rugged terrain in Dominica results in high water distribution costs.

Risks attributable to climate change include seasonal drought-like conditions, floods, and landslides particularly in the high rainfall areas as well as hurricane and storm activities. Substantial human and economic losses are attributable to these events. Climate change continues to significantly accentuate these impacts and alter existing patterns of water availability and use.

Hon. Roosevelt Skerrit, Prime Minister, Budget Address. - June 29, 2011

Almost all surface water sources that feed DOWASCO's water systems suffer from high levels of turbidity during adverse weather conditions ranging from torrential rains to hurricanes. Additionally, the small water sources in particular, are unable to meet the water demand in the areas during the dry season. There are two major issues which need to be addressed; one is that of quality and the other is that of availability. Integrated Water Resources Management (IWRM) plays a significant role in the promotion of more sustainable approaches to water resources management and will provide a framework within which the following problems and inefficiencies may be overcome:

- *growing demand for water;*
- *inadequate institutional structure;*
- *ineffective land-use management;*
- *inadequate data and information to support decisions;*
- *climate variability;*
- *legislation that needs updating;*
- *lack of adequate human and financial resources.*

3.7. Coastal and Zones and Ecosystems

Coastal ecosystems are among the most productive and diverse habitat on the island, and support an expanding marine tourism industry. Dominica's communication infrastructure is concentrated within the coastal zone together with its major urban centers, key institutions, and commercial activities. Its naturally deep coastal waters support its vital water borne commerce including cruise ship and cargo vessel trade.

Population and development trends in Dominica indicate a continued coastal orientation in human settlement. This combined with other anthropogenic factors such as a fragmented

coastal policy, resource use conflicts, impacts from quarries, toxic chemicals, and nutrient enrichment of riverine and marine ecosystems represent some of the principal stresses on the marine environment. Natural stress factors, disasters, storm surges and the anticipated rise in sea level and increased variability in temperature are likely to exacerbate these problems and increase the stress on coastal environments and ultimately diminish their natural resilience.

The limited availability of flat land is a constraining factor to the sustainable management of Dominica's coastal resources. Nearly all of the islands' communication infrastructures (air and sea ports, roads and telecommunications networks) are found exclusively along the coastal peripheries which also support housing developments, schools, churches, and other important services. This form of coastal development not only adversely diminishes coastal biodiversity but also alters the pattern of sediment transport, beach accretion/erosion and options for short term adaptation responses such as the construction of sea defenses which are likely to further degrade the resilience of coastal systems.

3.8. Human Health

To a large extent, public health depends on the availability of safe drinking water, adequate food and nutrition, secure shelter, and good social conditions. For Dominica, climate change continues to affect all of these conditions, with the likelihood of increased incidents of water-borne and vector-borne diseases, and rising concerns over food security. The real effects of climate change on human health in Dominica will likely be dependent on the vulnerabilities resulting from economic, environmental, social, and health related impacts that will determine the populaces ability to ability to react and adapt.

The country's natural resource base as well as its commitment to provision of health care has resulted in significant achievements in health. Emerging concerns increasingly involve chromic non-communicable diseases including many, such as cardiac diseases and diabetes, which will be affected by projected changes in climatic parameters such as heat as well as by indirect impacts on food and nutrition. Other existing problems such as solid and liquid waste disposal also reduce resilience in the natural ecosystem and in the population of the country, thereby increasing vulnerability to health risks from a changing climate.

3.9. Infrastructure and Human Settlements

Problems associated with inadequate solid and liquid waste management present threats to coastal resource health, while increasing urbanization is resulting in traffic congestion and associated public transportation concerns. Energy issues are also of concern to human settlement planners since relatively long distances, rugged terrain and high costs of fuel make local transportation costs high. Vulnerability to disaster risks, both natural and man-made, are also increasing with urbanization. Underlying many of these problems are significant challenges deriving from the lack of available financing for human settlements.

Major landslide on Imperial Highway

Vulnerability of human settlements in Dominica to existing weather and climate change can be viewed in terms of risks from coastal processes, inland flooding, and landslides. A consistent feature of human settlements in Dominica is the vulnerability of roads and buildings to storm surge flooding and landslides. Inadequate planning controls are apparent in the continuing construction of buildings, critical infrastructure and other facilities in active wave inundation, flood- and landslide-prone areas.

3.10. Tourism

Dominica's tourism industry is based largely on its position as an eco-tourism destination, with its verdant forests and other natural features being the country's principal income earners especially in relation to the cruise ship industry. Popular sites such as Trafalgar Falls and Indian River rely on rich forestry biodiversity, while the island's representation as the "***Nature Island of the Caribbean***" is based largely on a scenario of lush forests and accompanying eco-tourism oriented attractions. With the tourism industry as one of Dominica's principal economic sectors and natural forests, along with pristine marine ecosystems, being the main attractions, there is considerable economic interest interrelated with the management of Dominica's natural resources. However, these resources are constantly damaged by hurricanes and threatened by climate variability and associated effects on forest ecosystems and watersheds (see below).

3.11. Forestry and Biodiversity

A number of factors reduce the natural resilience of Dominica's forests ecosystems and increase their vulnerability to climate change and climate variability. Many natural hazards periodically affect or threaten Dominica, among them hurricanes, earthquakes, volcanic eruptions, storm

surges, and landslides. These natural disasters can be attributed as one of the root causes of biodiversity loss in Dominica. Hurricane David in 1979 caused significant impacts on the island's forest resources, causing damage to in excess of 50% of the trees in the southern half of the island (Forestry Division, 1993).

Hurricanes cause loss of habitat and food supplies for wildlife species and result in wildlife mortality. An indirect resultant effect Hurricane David was the conversion of wildlife habitat to agriculture. In accessible areas the toppled trees provide an opportunity to more easily clear land for farming, resulting in a further fragmentation of wildlife habitat (NBAP. 2001).

More recently Hurricane Dean in 2007 caused extensive defoliation resulting in loss of up to 35 percent of the forest cover over the eastern forest range (FAO, 2007). Forest destruction from hurricanes recovers slowly with ecological implications such as land-slides and soil loss and consequent socio-economic impacts such as impact on water quality and availability, and possible short to medium term tourism impacts.

3.12. Educational Sector

Vulnerability to climate change is increasing, and opportunities for sustainable adaptive measures are not being realized because stakeholders fail to take action due to inadequate understanding and information on climate change issues and concerns. There is a critical need for increased awareness of climate change among senior technical/managerial level and policy makers in public/private sectors, and a need for increased awareness within select target groups (e.g. schoolchildren, media, and disaster response personnel, building contractors).

4. Overview and linkage to existing development plans and programs

Recognising the threats posed by climate change, Dominica has, over the last two decades, undertaken a number of initiatives to respond to this threat. Dominica ratified the *United Nations Framework Convention on Climate Change* (UNFCCC) in March 1994, and joined the community of nations committed to combating global climate change. In December 2001, Dominica submitted its *Initial National Communications* (INC) to the UNFCCC, in fulfilment of its obligations under Article 12 of the Convention. This process was followed by the development of a ***National Climate Change Adaptation Policy***, formulated with support under the *Caribbean Planning for Adaptation to Climate Change* (CPACC) Project, which was

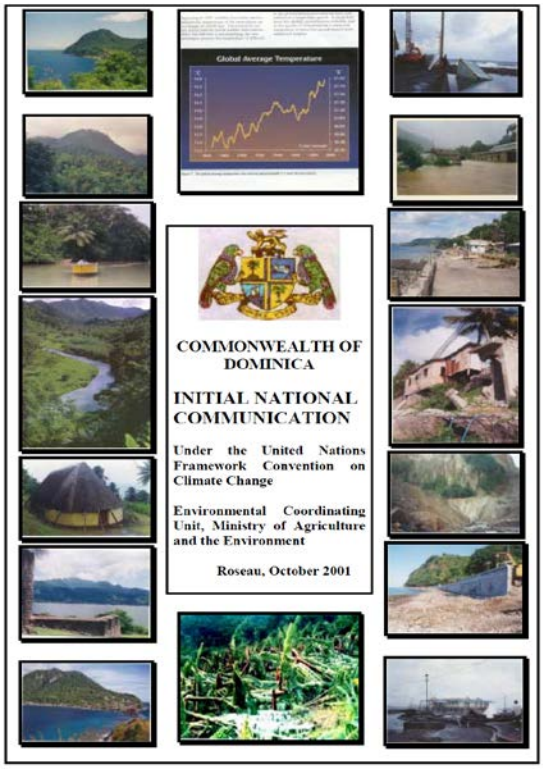
adopted by the Cabinet in 2002. In January 2005, the Phase II Enabling Activity, under the UNFCCC was completed, which involved capacity building for climate change.

Dominica has established a strong track record on climate change adaptation, and in this regards was one of the few countries chosen to pilot adaptation measures under the *Special Program on Adaptation to Climate Change* (SPACC) (see below). Additionally, as a collaborative initiative between the SPACC program and the GEF-funded *Sustainable Land Management* (SLM) project, Dominica has pioneered: (a) the vulnerability mapping and "climate proofing" of National Parks Management Plans; and (b) community-based vulnerability mapping and the development, through community engagement and input, of community adaptation plans. Dominica has a history of successful implementing projects supported by multi-lateral partners upon which this ***Low-Carbon Climate-Resilient Development Strategy*** builds upon. In particular, the Strategy will build upon the outcomes of and benefits achieved from the following initiatives.

4.1. Initial National Communication (INC) on Climate Change

Executed by the UNDP and Dominica's Environmental Coordinating Unit (ECU), the *Initial National Communication* was submitted in December 2001 to the United Nations Development Programme (UNDP) and the Secretariat of the UNFCCC. It details a description of Dominica's National Circumstances and included the following activities:

- National Greenhouse Gas Inventory (1994);
- An Assessment of Dominica's Vulnerability to the potential impacts of climate change;
- An outline of the existing Institutional Framework for mitigation and adaptation;
- An analysis of potential national response measures to abate the increase in greenhouse gas emissions and to adapt to climate change; and
- Preparation of a National Action Plan to address climate change and its adverse impacts, including a list of priority actions to be implemented in the short term.



The INC process enhanced the general awareness and knowledge of climate change-related issues in Dominica and strengthened the dialogue, information exchange and cooperation among all relevant stakeholders including Government, non-government, civil society and private sector agencies.

4.2. Initial National Communication (INC) Phase II Project - Building Capacity to Respond to Climate Change

Executed in 2005 by the UNDP and Dominica's ECU, the INC Phase II Project was a capacity building project intended to build upon the activities completed in the context of Dominica's INC. The overall goal was to allow Dominica to extend current knowledge to facilitate the emergence of national networks and promote the integration of climate change concerns in the developing national dialogue.

The analysis indicated that Dominica has significant capacity deficiencies in each of the thematic areas reviewed - Technology Needs, Systematic Observation Networks and Improvement in GHG Emission Factors. Also the data being collected was inadequate to support monitoring of climate change trends in Dominica. Additionally, current economic constraints will limit the extent to which the Government can aggressively respond to these capacity deficiencies. A number of recommendations were made to enable Dominica to improve its capacity to address climate change issues, which are to be addressed under Dominica's ***Low-Carbon Climate-Resilient Development Strategy***.

The Phase II Project also indicated that Dominica lacks a significant *institutional capacity* to carry out its responsibilities and obligations. There is no central clearing house for data and no standard procedure for monitoring rainfall and other climate variables. Additionally, there is the absence of legal obligations for the collection of GHG related data. As well as there is a lack of sensitization on GHG emissions, its sources and impacts and therefore a lack of awareness among those who are engaged in GHG emission related activities and enterprises.

Capacity building investments under the **Low Carbon Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** builds on the assessments undertaken and recommendations formulated under the INC and INC Phase II projects.

4.3. Second National Communication (SNC) on Climate Change

Executed by the UNDP and Dominica's ECU, the *Second National Communication* (SNC) is in the final stage of its development, where all components are being compiled into a single document. The SNC is intended to build on activities started in the *Initial National Communication,* and the Phase II Enabling Activities, and other related climate change activities. It is also intended to address any new areas that may have arisen or needs more emphasis. **Dominica's *Low-Carbon Climate Resilient Strategy*** builds on all components and recommendations made within the SNC.

4.4. Caribbean Planning for Adaptation to Climate Change (CPACC) Project.

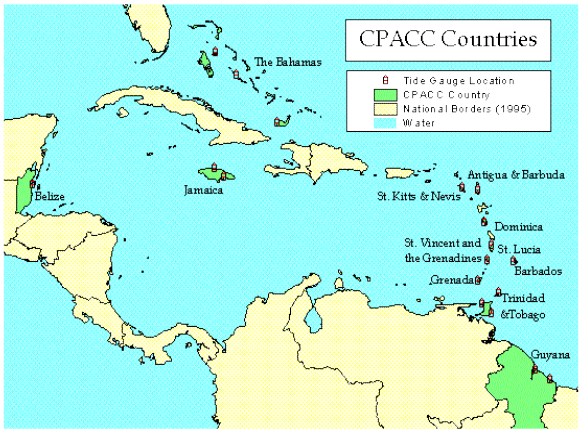
In 1994, Barbados hosted the Global Conference on the Sustainable Development of Small Island Developing States. The resulting *Barbados Programme of Action* (BPoA) emanating from the Conference identified climate change as a major environmental issue to be addressed by Small Island Developing States (SIDS). As a result, Dominica and eleven Caribbean countries developed and successfully implemented a GEF-funded regional project – the ***Caribbean Planning for Adaptation to Climate Change*** (CPACC) (1998-2001). The overall objective of

the CPACC project, which was executed by the World Bank and Organization of American States (OAS), was to assist Caribbean countries in launching ***Stage I*** adaptation measures aimed at building capacity to cope with the adverse effects of global climate change, particularly sea-level rise, in coastal and marine areas, through vulnerability assessment, adaptation planning and related capacity-building initiatives. Participating countries in CPACC included the majority of CARICOM members (Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Trinidad and Tobago). CPACC consisted of four regional projects and five pilot projects. The regional projects were:

1. Design and establishment of a sea level/climate monitoring network;
2. Establishment of databases and information systems;
3. Inventory of coastal resources; and
4. Use and formulation of initial adaptation policies.

The five pilot projects were:

1. Coral reef monitoring for climate change (Bahamas, Belize, and Jamaica);
2. Coastal vulnerability and risk assessment (Barbados, Guyana, and Grenada);
3. Economic valuation of coastal and marine resources (Dominica, Saint Lucia, and Trinidad and Tobago);
4. Formation of economic/regulatory proposals (Antigua and Barbuda, and St Kitts and Nevis); and
5. National communications (St Vincent and the Grenadines).



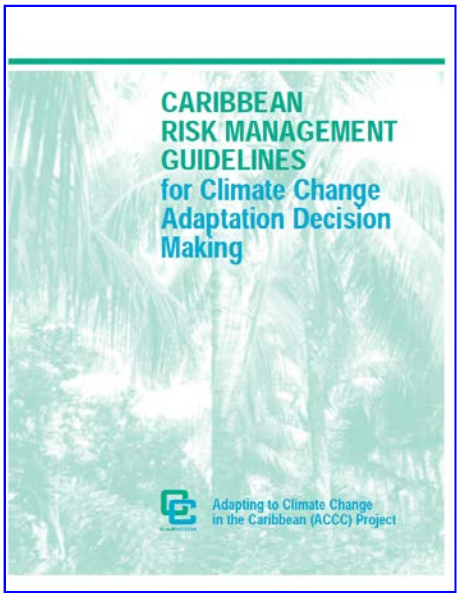
Under this project Dominica was one of only three countries in CARICOM that successful developed, through broad-based consultation, and adopted a ***National Climate Change Adaptation Policy*** which was approved by Cabinet in 2002. A critical review of Dominica's ***National Climate Change Adaptation Policy*** was undertaken to identify and prioritise investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy.***

4.5. Adaptation to Climate Change in the Caribbean (ACCC) Project

Further capacity-building was provided to the region through a CIDA-funded project (2001-2004), the ***Adaptation to Climate Change in the Caribbean*** (ACCC) project which was a follow-up to CPACC. This project was designed to sustain activities initiated under CPACC and to address issues of adaptation and capacity building not undertaken by CPACC, thus further building capacity for climate change adaptation in the Caribbean region. ACCC also facilitated the transformation of the Regional Project Implementation Unit (RPIU) originally established through CPACC into a legal regional entity for climate change (Caribbean Community Climate Change Centre). It did so by providing the resources to develop a comprehensive business plan for the Centre and a strategy to ensure its financial sustainability. Under this project the

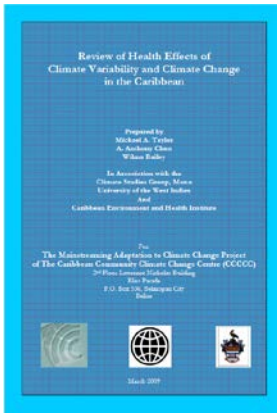
following activities were executed using the same administrative arrangements utilized for CPACC:

- Concept design and business plan development for the proposed Caribbean Community Climate Change Center;
- Public education and outreach;
- Integration of climate change into a physical planning process using a risk management approach to adaptation to climate change ;
- Strengthening of regional technical capacity, in partnership with the Caribbean Institute for Meteorology and Hydrology (CIMH), the University of the West Indies (Scenario Projection and Establishment of Climate Change Master's Programme), and the Caribbean Environmental Health Institute, in order to enhance association between Caribbean and South Pacific small island States;
- Integration of adaptation planning in environmental assessments for national and regional development projects;
- Implementation strategies for adaptation in the water sector;
- Formulation of adaptation strategies to protect human health;
- Adaptation strategies for agriculture and food; and
- Fostering of collaboration/cooperation with non-CARICOM countries.



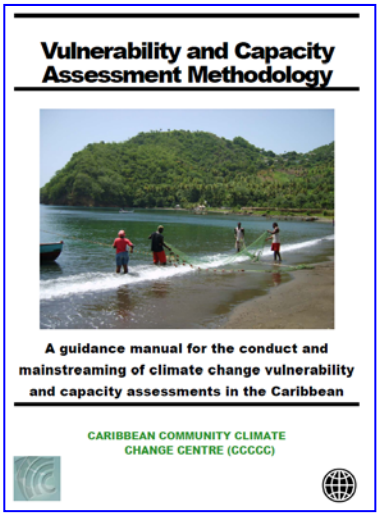
The *Caribbean Risk Management Guidelines for Climate Change Adaptation Decision Making* developed under this project were used by technical working groups to undertake the risk assessments and ranking of priority needs that constitute the basis for the investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy.*** Additionally, investments to address food security under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** build on the assessments undertaken under the ACCC project.

4.6. Mainstreaming Adaptation to Climate Change in the Caribbean (MACC)



A regional project funded by the Global Environment Facility (GEF) - the ***Mainstreaming Adaptation to Climate Change*** (MACC) – was implemented in Dominica and 11 other CARICOM countries from 2004 to 2007. Executed by the World Bank and the Caribbean Community Climate Change Center (CCCCC), the project's main objective was to mainstream climate change adaptation strategies into the sustainable development agendas of the Small Island and low-lying states of CARICOM. MACC adopted a learning-by-doing approach to capacity building, consolidating the achievements of CPACC and ACCC. It built on the progress achieved in these past projects by furthering institutional capacity, strengthening the knowledge base, and deepening awareness and participation.

The *Mainstreaming Adaptation to Climate Change in the Caribbean* (MACC) Programme sought to reduce vulnerability (physical, social, economic and environmental) of Caribbean countries to the impacts of climate change. It built capacity of the SIDS to develop Stage II adaptation strategies and measures (as defined by the Conference of Parties (COP) to the UNFCCC) through the mainstreaming of adaptation into national development planning process of the countries in the region. This was done through several programme areas and pilot projects.



The climate vulnerability risk assessment foci for MACC were in the areas of Water Resources, Tourism, Health, Agriculture and Coastal Zone. MACC also focused on Public Education and Outreach (PEO) strategies as a major component of the programme. **Dominica's *Low-Carbon Climate Resilient Strategy*** utilizes strategic information from this MACC programme to build climate change public education and outreach (PEO) activities.

4.7. Special Programme for Adaptation to Climate Change: Implementation of Adaptation Measures in Coastal Zones (SPACC) Project.

The four-year GEF-funded *Special Programme for Adaptation to Climate Change: Implementation of Adaptation Measures in Coastal Zones* (SPACC) Project, executed by the World Bank and the Caribbean Community Climate Change Center (CCCCC), completed in December 2011, supported efforts by Dominica, Saint Lucia and St. Vincent and the Grenadines to implement specific (integrated) pilot adaptation measures addressing the impacts of climate change on the natural resource base of the region, focusing on biodiversity and land degradation along coastal and near-coastal areas. This was achieved through:

(i) The detailed design of pilot adaptation measures to reduce expected negative impacts of climate change on marine and terrestrial biodiversity and land degradation;
(ii) The implementation of pilot adaptation measures.

The project also produced knowledge of global value on how to implement adaptation measures in Small Island developing States that can be applied in other countries in the region. In Dominica the two sites identified for the detailed design and implementation of adaptation measures were:

(a) The Morne Diablotin National Park (MDNP) and its neighbouring communities of Colihaut, Dublanc and Bioche (CDB) communities;
(b) The Morne Trois Pitons National Parks.

As collaborative initiative between the SPACC program and the GEF-funded *Sustainable Land Management (*SLM) project (see below), Dominica has pioneered:

(a) vulnerability mapping of the country's National Parks and World Heritage Site and "climate proofing" of the World Heritage Site Management Plan and National Parks Management Plans; and
(b) Community-based vulnerability mapping and the development, through community engagement and input, of community adaptation plans.

Example of community-based vulnerability map (actual size 48” x 36”) and the development, through community engagement and input, of community adaptation plans developed in 10 pilot communities under SPACC/SLM project.

Tourism in Dominica is intricately linked to forests (beaches are not the primary attraction since the country is largely devoid of "white" sandy beaches), with the country promoting eco-tourism as its primary tourism product. The SPACC project has made considerable advances in "climate proofing" Dominica's forests and protected areas upon which the country's tourism industry relies. This has been achieved by mapping vulnerability of these areas from encroachment and consulting with communities to establish an appropriate buffer area that will reduce threats from human encroachment.

Investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** build on these pioneering adaptation initiatives and will support the transition to improved climate resilience in Dominica.

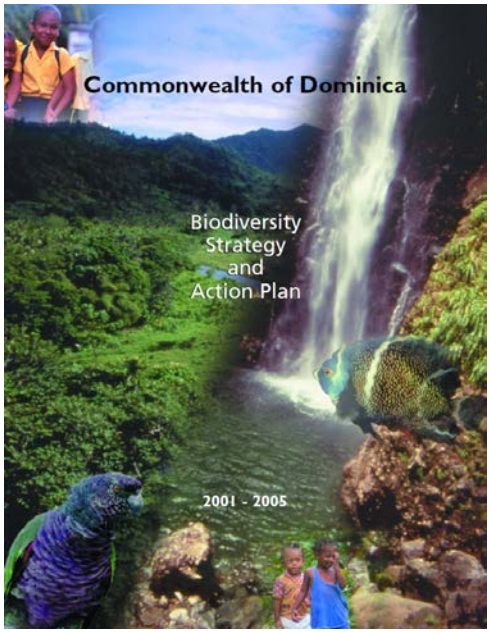
4.8. National Capacity Self-Assessment

Executed by the UNDP and Dominica's ECU, the *National Capacity Self-Assessment* (NCSA) process commenced in Dominica in January 2004 and was completed by July 2005. It focused on three thematic areas, Land Degradation, Biodiversity and Climate Change. The objective of the NCSA process was to allow for a thorough assessment of the capacity needs and constraints (individual, institutional, systematic) facing national efforts to improve environmental conservation and sustainable development programmes, and to meet global environmental management obligations, principally the three Rio Conventions. The NCSA process also analyzed the institutional capacity framework that was initiated under the UNFCCC and the National Biodiversity Strategy and Action Plan (NBSAP), and facilitated the identification of management strategies relevant to sustainable environmental development. Key gaps/needs identified under the NCSA include the need for comprehensive environmental and natural resources management legislation, the legal establishment of a Department of Environment, and the strengthening of physical planning processes.

Capacity building investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** builds upon information gathered from the NCSA process, and will address key priority capacity issues, capacity constraints, corrective actions and establish an integrated approach to the implementation of related Conventions.

4.9. National Biodiversity Strategy and Action Plan

The *National Biodiversity Strategy and Action Plan* (NBSAP) was developed in keeping with Dominica's obligations under the *Convention on Biological Diversity* (CBD). Executed by the UNDP and Dominica's ECU, this project supported country assessments which fed into the Strategy and Action Plan. The Plan was executed for a five-year period (2000 – 2005) and its aim was to establish the mechanisms to provide for the conservation and sustainable management of Dominica's terrestrial and marine biodiversity. The NBSAP examined key areas that impact biodiversity and highlighted several



issues that undermine the resilience of natural ecosystems, including from climate change. The NBSAP is one of the first documents that comprehensively examined environmental issues in Dominica, and specifically mentions climate change impacts on the country's biodiversity and measures required to address such impacts.

Measures to enhance ecosystem resilience and address gaps/issues under the NBSAP will be supported under the **Climate Resilient Development Pathway** of Dominica's ***Low-Carbon Climate Resilient Strategy*** which builds upon analysis undertaken and recommendations contained in Dominica's *National Biodiversity Strategy and Action Plan.*

4.10. National Hurricane and Disaster Preparedness Plan for the Agriculture Sector

A *Preliminary National Report* on disaster preparedness for the agriculture sector noted that the primary natural hazard affecting Dominica is intense tropical systems and their attendant impacts, soil erosion, landslides and floods, which result in a tremendous loss of agriculture resources. While the *National Disaster Plan* (NDP) (1996) outlines activities that will enable the sector to return to normalcy after such occurrences, it does not include any structural changes needed for the sector to address climate change risks, nor disaster preparedness and mitigation interventions required to reduce vulnerability. The absence of such strategies lends to the threats posed to food security, in addition to business and financial risks facing the agriculture sector. With funding made available from the Food and Agriculture Organization (FAO), Dominica has prepared a *National Hurricane and Disaster Preparedness Plan for the Agriculture Sector*. Activities under the Plan are intended to catalyse disaster management actions within agriculture and related sectors.

Investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** build on these initiatives towards improved climate resilient Disaster Management, Human Settlement and Infrastructure in Dominica.

4. 11. Capacity Building and Mainstreaming of Sustainable Land Management (SLM) in the Commonwealth of Dominica

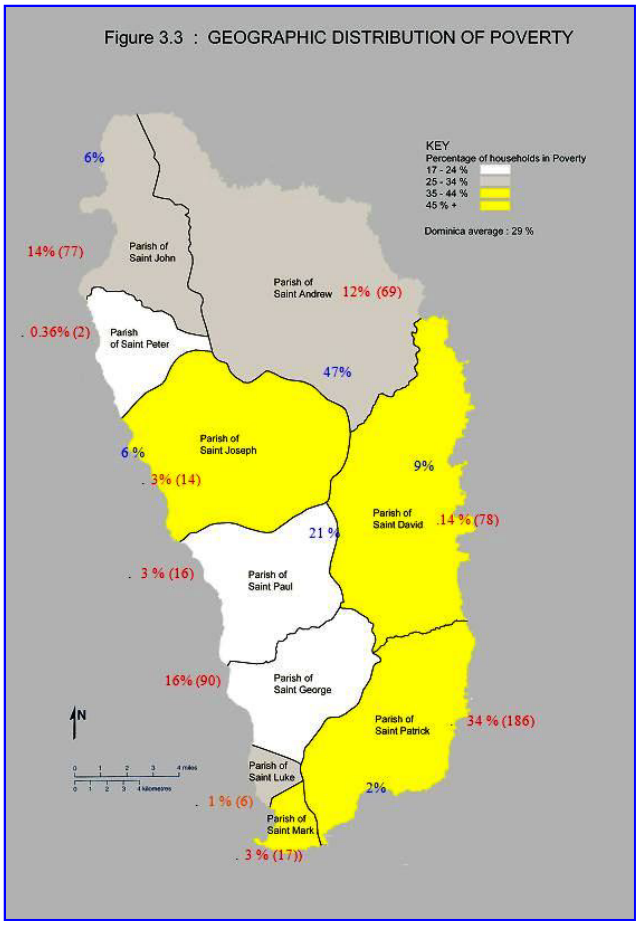
This three-year GEF-funded project, which commenced in 2009 and is executed by the UNDP and Dominica's ECU, is developing capacities for sustainable land management (SLM) in appropriate government, civil society institutions, communities and other user groups in order to mainstream SLM management considerations into government planning and strategy development. The project is building capacity to contribute to the enhancement and maintenance of the ecological integrity and productivity of terrestrial and near-shore

ecosystems the integrated management of land resources. Through the establishment of comprehensive legal, policy and institutional framework for environmental protection and sound natural resource management, the project is ensuring that agricultural, coastal, forestry and other terrestrial land and resources uses in Dominica are sustainable, thereby enhancing ecosystem resilience and allowing for the maintenance of productive systems that assure ecosystem productivity and ecological functions while contributing directly to the environmental, economic and social wellbeing of the people of Dominica. The project worked with the SPACC project to develop ***Community Vulnerability Atlases*** and ***Community Climate Change Adaptation Plans*** that can be replicated throughout Dominica and the Caribbean region.

Investments under the **Climate Resilient Development Pathway** of **Dominica's *Low-Carbon Climate Resilient Strategy*** build on these initiatives towards improved climate resilience in Dominica.

4.12. Growth and Social Protection Strategy

The Government of Dominica's *Growth and Social Protection Strategy* (GSPS) articulates a medium-term strategy for growth and poverty reduction over the next five years. Priorities set in this document make poverty reduction the principal focus of Government's economic and social policy. The Government of Dominica regards the pursuit of sustained strong economic growth to be the main strategy to alleviate poverty. The GSPS provides the framework that informs the medium-term macro-economic framework, the structural reform agenda, the medium-term public investment programme, and the annual budgets to be presented to Parliament. The Government's policies and programmes will seek to ensure that opportunities are available to all, and benefits from growth are shared across the society as widely as possible. To this end, targeting and management of the existing social programmes will also be improved.



The GSPS provides the framework for Dominica's economic and social policies over the next five years and sets out the macroeconomic framework; the growth strategy including the enabling environment for private enterprise and sectoral strategies; and poverty reduction and social protection programmes. It also provides for the monitoring and evaluation of the progress in implementing the strategy on an annual basis.

The consultative process to which it has been subjected ensures that the GSPS has a high degree of public ownership. The first edition of the GSPS was published in April 2006. The Government has updated the Strategy on an annual basis so that the document is a "rolling plan" that takes account of changing circumstances and is thus of continuing relevance and usefulness. The third edition of the GSPS is currently before Cabinet for approval.

Investments under **Dominica's *Low-Carbon Climate Resilient Strategy*** are anchored in the *Sector Strategies for Growth* defined in the GSPS, including:

Agriculture

- agriculture diversification and agro-processing to address threats to food security from climate change;
- rehabilitation and climate proofing of farm access roads to improve access to markets;
- embarking on programme of action to establish Dominica as an 'Organic Island' with a view to establishing agricultural practices that will enhance the resilience of natural ecosystems by reducing the introduction of harmful substances into rivers and soils and establish a sound and sustainable basis for the growth of the agricultural sector so as to address threats to food security from climate change;
- improving climate change risk micro-insurance and micro-finance in existing financial institutions for small-scale operators to make resources available to farmers who need to invest in irrigation equipment in order to bring water onto their farms;

Natural Resources

- accessing opportunities for international or regional agreements for carbon sequestration for forest that can contribute to the socio-economic development of Dominica where appropriate by promoting the carbon neutral status of Dominica;

- enhancing the resilience of natural resources, through:
  - working to increase by 50% the number of agro-forestry farmers through REDD+ programs; and
  - implementation of projects to expand organic banana production, improve integrated pest management; and increase the utilization of farm organic waste;
- promotion of sound Land-Use Planning to improve the resilience of natural resources and address impacts from flooding, landslides, and other extreme events;
- climate proofing of houses and promotion of building controls to prevent housing construction in vulnerable areas;
- establishment of integrated coastal zone management to enhance the resilience of coastal and marine ecosystems and address climate change and anthropogenic impacts;
- enhancing ecosystem resilience by reducing user conflict and promoting sustainable use of all natural resources, through the formulation of a coastal zone management plan;
- improving water management through preparation and execution of a national water inventory and water management policy;

> Government is aware of the importance of land use planning, especially in the context of its plans for a large expansion of the tourism sector. The impact of climate change makes this a more urgent imperative: "The disastrous impact of climate change, coupled with emerging challenges in land use and land management in Dominica, necessitate deliberate action to increase the island's resilience and establish a path of sustainable development. One avenue for achieving this goal is through a National Physical Development plan which recognises the relationship between natural resource use, environmental consequences and future economic viability".[37]

Fisheries

- climate proofing of fisheries infrastructure improvements to meet requirements of international standards and to facilitate fish export trade, improve access to and from sea, and the overall capacity to process greater volumes of catch;
- improving climate change risk micro-insurance and micro-finance in existing financial institutions for fisher folk;
- promotion of aquaculture industries to address threats to food security from climate change impacts on marine resources;

Tourism and Private Sector

- building capacity for climate change and disaster risk management in the private sector and tourism industry;
- addressing high energy costs for business and the tourism industry;
- enhancing marine and terrestrial ecosystem resilience as a key element of the country's tourism product;
- climate proofing proposed tourism infrastructure developments including proposed Roseau Waterfront, Cabrits/Portsmouth marina, Marine Visitor Centre, the redevelopment of the Marigot Fisheries Harbour to facilitate sea access from Guadeloupe, upgrade to Melville Hall airport and construction of the new airport to accommodate long haul services from North America and Europe;

Environmental Protection

- legally establish the Division of Environment, Climate Change and Development (DECCD) responsible for coordinating Dominica's climate change risk management program, enhancing ecosystem resilience by controlling pollution, and regulating development in flood prone areas;
- legally establish Climate Change and Disaster Trust Fund (5% of PSIP) to cover adaptation/mitigation and disaster prevention costs;
- climate change risks and environmental management capacity building to provide support for technical evaluation, regulation and monitoring of development projects;

> **11.6.2 Empowering Environmental Management**
>
> The role of our Environmental Coordinating Unit (ECU) will be reviewed with a view to clothing the agency with the authority and mandate that are appropriate to its envisaged responsibilities. Given the increasing importance to Dominica of issues relating to the environment, climate change and the greening of the economy, Government will be taking action to mandate and facilitate the ECU to become more proactive in promoting our country's green thrust.

Green Economy

- supporting micro and small business access opportunities in the Green Economy;
- attract suitable Green Economy businesses into Dominica;
- provide education, training and capacity building to enhance the skills base of the workforce to support Dominica's transition to a Green Economy;
- integrate green principles into national economic management and planning, and marry environmental preservation and management into Dominica's strategy for achieving higher levels of sustained economic growth;

> **11.6.1 Towards a Green Economy**
>
> At another level Government will be seeking more consciously to integrate green principles into national economic management and planning, and marry environmental preservation and management into our country's strategy for achieving higher levels of sustained economic growth. Government will also be contributing to ensuring that in his or her personal behaviour, a consciousness of and pride in our Nature Isle is manifested by every Dominican. Government believes that the Nature Isle should take the lead in enshrining green principles as the guide to our national planning, and to inform initiatives in all sectors.
>
> Government will also be paying attention to the larger environmental issues such as biodiversity, land degradation, climate change and the emission of green house gases that cause global warming.

Energy Conservation and Renewable Energy

- conserve energy and promote renewable energy options to address rising energy costs affecting the cost of living and quality of life, cost of manufacturing and services increase, and the challenge to competitiveness;

- increase percentage of national energy from renewable sources by harnessing geothermal, solar, wind and hydro energy potential;

Vulnerable Communities

- Address impacts of climate change on vulnerable segment of society, including indigenous Kalinago and women.

The Government takes the position that poverty reduction over the long term requires the creation of sustainable employment and income earning opportunities for all Dominicans, an objective that will come about only with increased levels of economic growth and development. Supporting the continued transition to a Green Economy will require the building of national capacity to implement **Dominica's *Low-Carbon Climate Resilient Strategy*** which is regarded as a key element in Government's plan to create sustainable quality employment opportunities.

The Government of Dominica will be launching a major climate change initiative early in 2012. It will be convening a National Consultative Workshop and International Development Partners Meeting on climate resilience. This workshop is being convened in collaboration with the World Bank under Dominica's *Pilot Program for Climate Resilience* (PPCR). Based on recommendations of an independent expert group, Dominica has been selected as one of seven countries in the Pan Caribbean Region to participate in the World Bank's *Pilot Programme for Climate Resilience* (PPCR).

Government expects that coming out of the workshop will be:

- A five-year strategic plan for climate resilience developed through broad-based participatory stakeholder input to facilitate Dominica's transformation to a climate-resilient and low-carbon development economy; and
- A strategy to address climate change impacts on agricultural productivity and food security within vulnerable communities that will promote economic growth while addressing pressing livelihood and poverty issues confronting Dominica.

4.13. Development of Alternative Energy Sources

The Government of Dominica in seeking to reduce the increasing costs of electricity generation and ensure a cleaner, more environmentally friendly energy source by aggressively exploring the possibilities of alternative energy. While hydroelectric generation does occur (contributing up to ~ 38% of electricity generation), and Dominica has considerable additional potential, hydro-power development is severely affected by changing precipitation patterns association with climate change. Dominica, being a volcanic island has tremendous potential for geothermal energy use. Feasibility studies have already been carried out in this regard. Presently, the government is collaborating with the GEF and the EU to explore and produce geothermal energy. Solar energy is also used in Dominica, but mainly at the residential level for water heating. It is hoped that hydro, solar, wind, wave and biomass as alternative energy sources, will eventually be utilized on a commercial scale.

5. Policy, Legal and Institutional Analysis:

Many policy documents have been developed and/or approved by the Cabinet of Ministers that are specific to climate change or that incorporate or specifically mention climate change (Table 2). This is important in the integration of climate change issues and concerns into the national processes. Dominica is also a part of the OECS, ALBA, CARICOM and AOSIS where effort is expended to ensure that climate change is addressed as a critical policy issue.

Table 2: Key National Policy Documents that Incorporate or make Specific Reference to Climate Change

Year	Policy Document
2012	Growth and Social Protection Strategy
2010	Montreal Protocol (Substances that Deplete the Ozone Layer) Regulations, 2010
2010	National Strategy for Health
2010	Sector Strategy, Natural Resources and Energy Sector Plan
2010	Tourism 2010 Policy
2010	Draft Environmental & Planning Regulations for Renewable Energy
2010	Draft Geothermal Development Bill
2010	National Energy Policy (Draft)
2010	National Integration Water Resources Management Policy (Draft)
2009	Dominica Forestry Policy
2009	Disaster Management Plan
2009	National Emergency Management Policy
2009	National Shelter Policy
2007	National Policy for the Agriculture – Environment (Agri – Eco) System, 2007 – 2025, Submitted for Cabinet's approval
2006	Growth and Social Protection Strategy
2006	*St. George's Declaration*
2005	National Biosafety Framework
2005	Draft National Implementation Plan on Persistent Organic Pollutants
2004	National Environment Policy/National Environment Management Strategy
2002	Dominica's Policy on Planning for Adaptation to Climate Change
2002	National Biodiversity Strategy and Action Plan
2002	Physical Planning Act
1998	Plan to reduce the vulnerability of school buildings to Natural Disasters

In addition to these policy documents that were prepared through extensive consultative processes, climate change has also received attention in recent budget addresses delivered by the Prime Minister of Dominica over the years. There have also been specific Cabinet Conclusions that are of relevance to climate change[2]. The various climate change and other projects undertaken by Dominica, including the INC, SNC, SLM and SPACC Projects discussed

previously, are specific efforts to integrate climate change into national development processes. **Dominica's *Low-Carbon Climate Resilient Strategy*** is expected to reinforce this integration and lead the transformation to a low carbon climate-resilient Dominica.
In Dominica, there are over 105 pieces of legislation relating to the environment and natural resource management some dating back over one hundred years - these can be broadly broken down into 5 categories (legislation dealing with human health, marine resources, terrestrial resources, human development and aquatic resources) and focus on dealing with a specific problem rather than taking an integrated approach to managing natural resources and the environment in a sustainable manner.

There have been a number of reviews of Dominica's environmental and resource management legislation over the past 15 years which have all come to the conclusion that comprehensive environmental and natural resource management legislation is an urgent priority in order to prevent irreversible environmental damage to the natural resources upon which Dominica relies for sustained economic and social development.

The existing legislation is outdated - many of the Acts pre-date the signing of international environmental agreements by Dominica that enshrine new and evolving environmental principles/concepts and concerns such as climate change and the sustainable use of natural resources, and the greater appreciation of the interconnectedness of environmental protection with other facets of development.

There are substantial gaps and overlap between existing legal mandates for natural resource management amongst various ministries with resultant confusion over jurisdiction roles – more particularly there is no legal basis to ensure:

- ***functional co-ordination*** amongst various Departments/agencies to ensure sound and coordinated environmental protection and the sustainable management of finite resources for Dominica's long term benefit;
- ***Site-specific coordination*** in the management of natural resources.

Save for a few pieces of legislation, present legislation ***does not meet Dominica's obligations under the 27 Multilateral Environmental Agreements (MEAs) to which the country is a signatory*** – most notably the agreements dealing with Climate Change, Pollutants and Hazardous Substances, Biodiversity, Biosafety.

- Dominica's physical planning legislation deals largely with terrestrial resources leaving inadequate regulatory control over aquatic, coastal or marine resources. There is no legally established institutional framework for coordinating environmental protection and natural resource management in Dominica.

- There is no legislation to ensure environmentally sound and sustainable management of natural resources outside forestry and parks areas.

- There is no legislation for the management of marine pollution, biosafety or hazardous substances.

- There is no legislation to control Greenhouse Gas (GHG) emissions or promote energy efficiency and the use of renewable energy.

A recent review undertaken under the GEF-funded *Sustainable Land Management* (SLM) project determined that consolidated Environmental and Natural Resource Management legislation is required as an urgent national priority in order to address the following gaps and deficiencies:

- legislation is required to address pollution and hazardous substances, climate change, introduction of new technologies and to implement Multilateral Environmental Agreements (MEAs) to which the country is a signatory;
- legal establishment of a department or agency is required to facilitate functional site-specific co-ordination for effective environmental protection and natural resource management, and to ensure the climate proofing of development activities;
- the establishment of effective and coordinated site-specific management of natural resources and environmental protection.

Cabinet approval has also been obtained to commence the consultation process to develop and draft comprehensive *Environmental, Climate Change and Development Legislation* for Dominica in collaboration with the Office of the Attorney General. This new legislation is expected to establish key legal and institutional frameworks needed to effectively implement **Dominica's *Low-Carbon Climate Resilient Strategy.*** Government expects to enact this new legislation by the end of 2012.

6. Participation Process

Dominica's *Low-Carbon Climate Resilient Strategy* has been developed through an extensive consultative process that was supported under the Pilot Program for Climate Resilience (PPCR) funded under the Climate Investment Funds (CIF). As part of the process to develop **Dominica's *Low-Carbon Climate Resilient Strategy***, *v*arious assessments and studies were undertaken and reviewed with and by national stakeholders (see Figure 2) to provide the technical foundation for the preparation of the Strategy, including:

- ***Document stocktaking, review and analysis*** including critical review of *Dominica's Climate Change Adaptation Policy and Action Plan* (2002);
- Broad-based stakeholder ***climate change risk assessment*** including prioritization and ranking of climate change risks affecting Dominica;
- Critical review of Dominica's *National Capacity Self-Assessment (NCSA)* and ***Adaptive Capacity Assessment*** (institutional, systematic, individual capacity) for public and private sector, vulnerable communities, and sectors;
- ***Community Surveys*** to identify climate change vulnerabilities, capacities and priority needs;
- Identification of ***priority needs and investment opportunities*** to facilitate Dominica's transformation to a climate-resilient economy with PPCR support;
- ***Cost-benefit Analysis*** (and ***Return on Investment Analysis*** for PPCR Loan) of proposed SPCR investment opportunities;

Figure 2 – Institutional Framework for Strategy Preparation

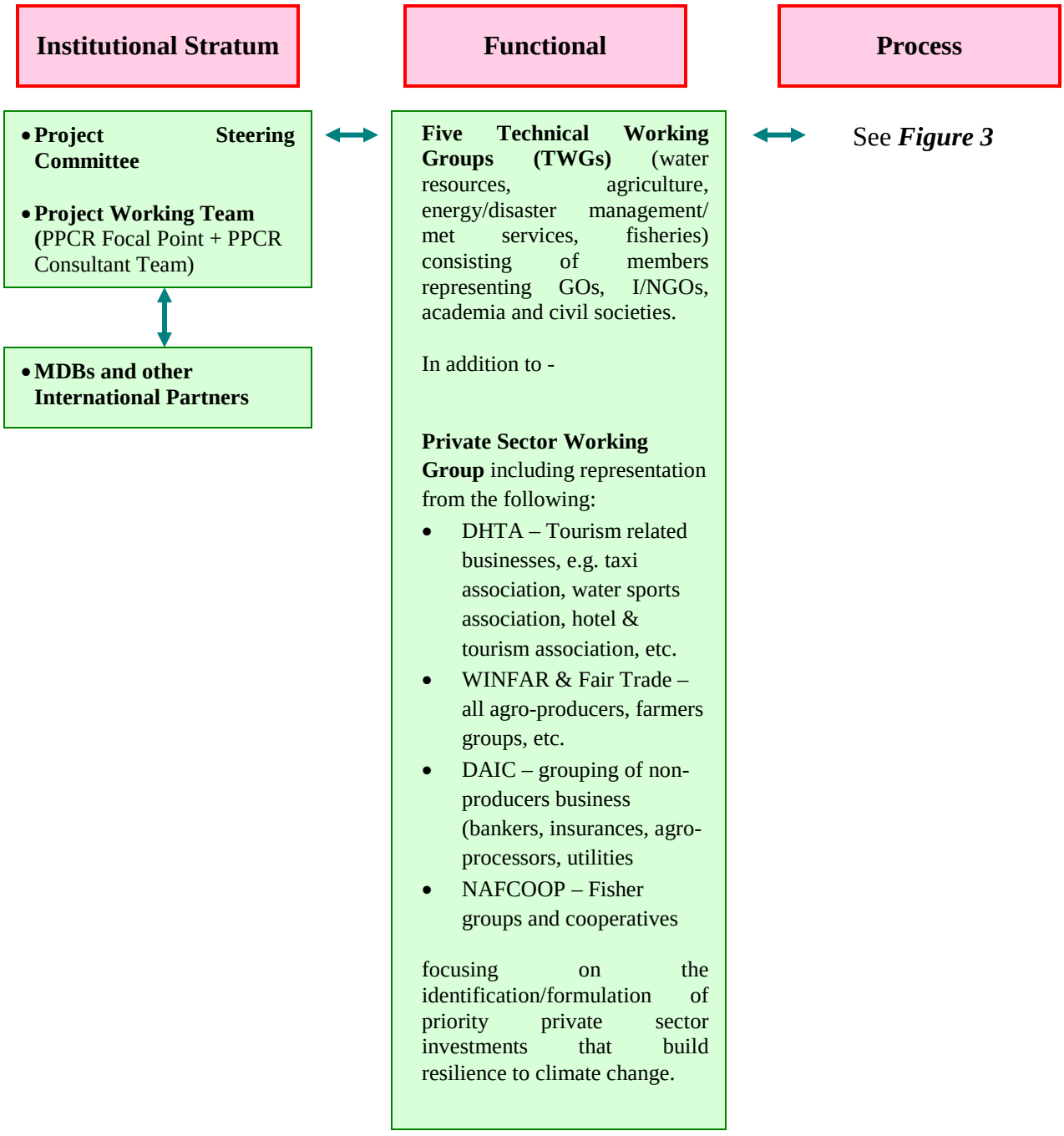
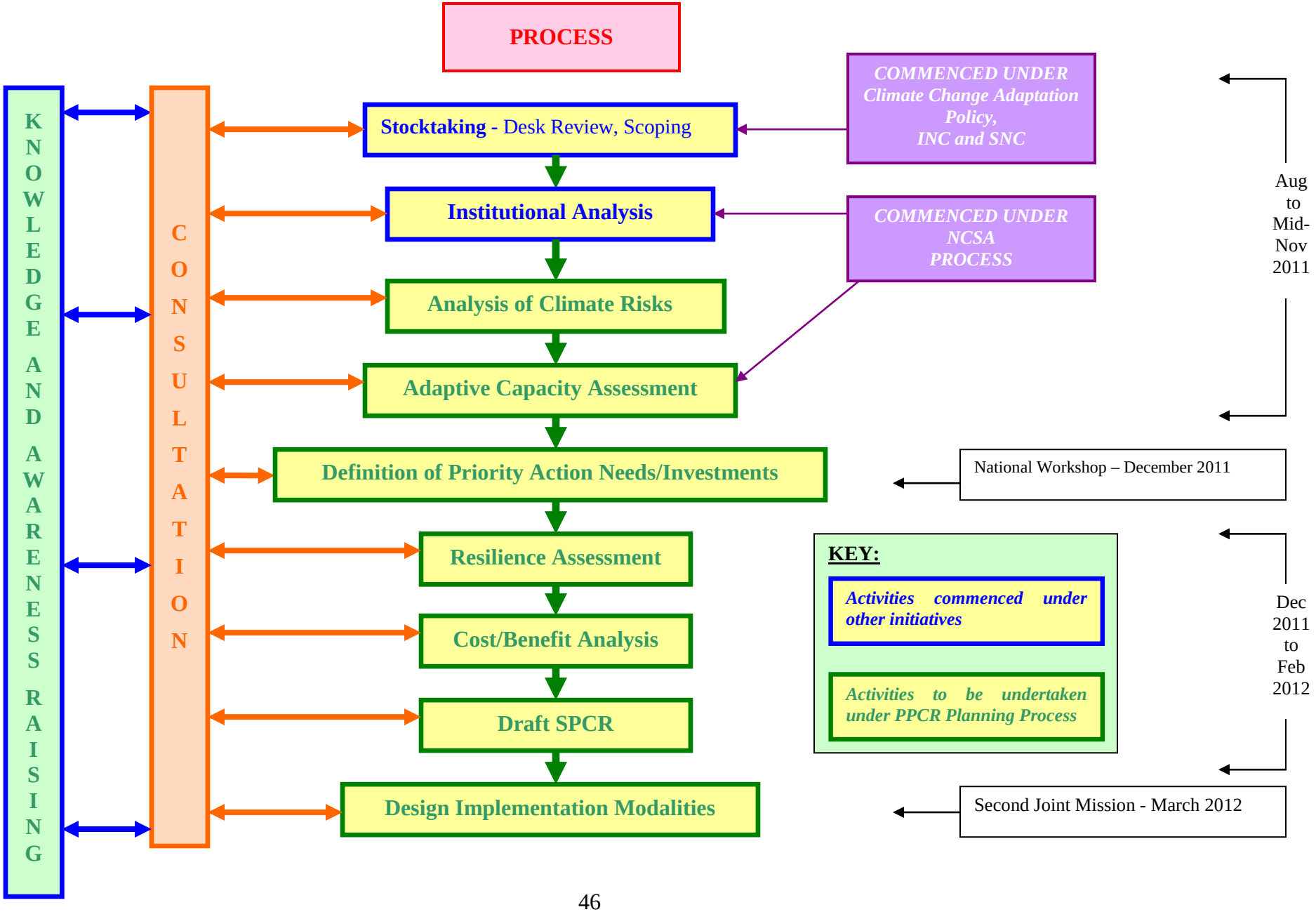


Figure 3 - Methodical Approach to Strategy Preparation in Dominica



- ***Preparation of* Dominica's *Low-Carbon Climate Resilient Strategy*** and related Investment Plan for submission to Development partners including the PPCR-SC and Adaptation Fund;
- ***Capacity building needs assessment*** to facilitate Dominica's transformation to a climate-resilient economy that addresses priority climate change risks to agriculture and food security, livelihoods, the economy, water security/quality, and supports national poverty alleviation efforts;
- ***Public education and outreach*** surrounding context-specific climate impacts and the Strategy.

During this stakeholder consultation process, several hundred individuals have been consulted including Cabinet Ministers, representatives from government agencies (national, local and municipal), the private sector, civil society, and vulnerable segments of society including indigenous Kalinago, women and youth. This level of consultation has ensured a high level of national ownership for **Dominica's *Low-Carbon Climate Resilient Strategy***.

Part II – Proposed Investment Program Components for Climate Change Finance

7. Rational for Climate Change Financial Support

Existing vulnerabilities to extreme weather events and their associated effects already constitute an important obstacle to sustainable development in Dominica. Climate change is affecting all sectors of Dominica`s society and many livelihoods, and the country does not have the resources required to address all impacts. As part of the process to develop **Dominica's *Low-Carbon Climate Resilient Strategy,*** a risk assessment was undertaken by national experts and a broad range of national stakeholders to identify and prioritise areas where Government needs to focus resources (financial, technical, human). The results of the risk assessment are summarised in Table 3.

Table 3 - SUMMARY OF CLIMATE CHANGE RISKS

Event Risks and *Outcome Risks*	**Ranking of Risks (10 highest)**
Increase in extreme events and climate variability (Cumulative Risks) - ***Physical damage to crops and agricultural access roads, impact on agricultural and fisheries productivity, increase of pests/disease, impact on livelihoods and food security***	**10**
Increase in extreme events - ***More frequent economic setbacks, prolonged recovery periods, stress on economy (including increase in loss of life, impact on tourism arrivals, impact on agricultural production, food security, forest cover), and less attractive environment for foreign investment due to cumulative destruction of critical infrastructure for tourism, manufacturing, agriculture, trade***	**10**
Increase in extreme events (increased intensity of hurricanes, flooding, landslides) – ***Increased damage to houses, human settlements, critical infrastructure, business and other properties***	**10**
Sea level rise – combined with increased incidents of storm surges - ***Damage to coastal infrastructure (roads, ports, jetties, storage, processing, packing, landing sites) used for agricultural trade and access to markets***	**9**

Increased frequency of extreme events - ***Water shortages due to increased drought and storms*** (Note: includes loss to crops)	**9**
Sea level rise – combined with increased incidents of storm surges - ***Damage to coastal tourism facilities (beaches, hotels, airports, cruise ship terminals)*** (NOTE: Includes impacts on Carib Territory and lost income to farmers)	**8**
Sea level rise and storm surge - ***Loss of coral reefs – loss of protection to coastal areas and impact of marine ecosystem and associated effect on livelihoods and food security***	**8**
Climate variability - ***Loss and impact on marine and terrestrial biodiversity which is key pillar for tourism***	**8**
Changes in rainfall intensity -***Increased coastal marine habitat degradation and damage to fisheries infrastructure***	**8**
Increased climate variability - ***Changes in fish and marine mammal migration patterns affecting food security and tourism***	**8**
Changes in rainfall patterns - ***Increased incidents of landslides affecting houses, human settlements and infrastructure, in addition to costs for insurance and building loans***	**8**
Increase in extreme events – ***Damage to coastal property and infrastructure due to storms surges***	**7**
Increase in extreme events - ***Reduced availability of international donor funding due to increased demand for emergency assistance from vulnerable countries***	**7**
Changes in national and local temperatures regimes - ***Increased damage to buildings and water cisterns from extreme dry conditions***	**7**
Sea level rise – combined with increased incidents of storm surges - ***Increased costs for insurance, re-insurance and costs to banks providing loans for coastal infrastructure***	**6**
Increased climate variability - ***Increased land degradation*** (variation in temperature) (Note: impact on food production, water quality, health and nutrition)	**6**
Changes in rainfall patterns - ***Impact on water quality/supply and costs of water treatment/delivery and damage to water/communication infrastructure*** (NOTE: hotels and restaurants at tipping point and loss of income due to lack of water could put them out of business)	**6**
Increased climate variability - ***Decline in tourism visitor arrivals due to more mild conditions affecting winter tourism market***	**6**
Sea level rise and storm surge - ***Damage to coastal infrastructure from sea level rise and higher storm surges and associated impact on tourism (hotels, dive industry, yachting)*** (Note: Significant cultural loss in Carib Territory and loss of beaches for recreation)	**6**
Increase in extreme events - ***Increase cost of coastal resources management***	**6**
Increase in extreme events - ***Damage to water infrastructure and impact on costs for water supply***	**6**

While there are several sectors and issues identified by stakeholders as being important to address climate change risks in Dominica, there are a few that require priority attention. Outlined below are the issues considered by national stakeholders to be a priority for Dominica, and which possess the greatest potential to contribute to the successful transformation of the country to a climate resilient low carbon development path.

1. Development of a ***national strategy*** – adopted at the highest level - to facilitate Dominica's transformation to a low-carbon climate-resilient economy while addressing pressing development, livelihood and poverty issues confronting the country;
2. Addressing climate change ***mitigation measures*** on the understanding that savings in energy costs will allow Dominica to invest more in much needed ***adaptation measures***;
3. Addressing climate change impacts on ***vulnerable sectors*** (particularly agriculture, fisheries and water resources) and communities, in order to address threats to food security, human health, poverty alleviation, sustainable livelihoods and economic growth;
4. Implementing measures that ***will have a positive impact on social capital, the quality of basic services, and natural resources that provide essential environmental services;***
5. Facilitating ***capacity building*** through education, awareness and training programme on climate change risks and resiliency measures in order to strengthen capacity at the community and sectoral level, within municipalities and local authorities, and the private sector;
6. Establishing a legal and institutional framework to ensure ***improved coordination*** of priority climate change measures;
7. Developing climate change ***standards and guidelines*** for climate proofing the private sector;
8. Establishing a ***sustainable financing mechanism*** to ensure timely and readily available financial support to implement priority climate change risks management measures by vulnerable communities.

The *Adaptive Capacity Assessment* undertaken during the PPCR planning process has identified ***considerable limitations in climate change risk management capacity*** at the systematic, institutional and individual levels, at the national, sectoral, district and local level, and within the public sector and civil society, highlighting the need for considerable capacity building. The *Adaptive Capacity Assessment* confirmed the need for improved levels of earmarked financial resources for climate change risk management and resiliency building as highlighted in the NCSA, and the need for building the capacities of key state and non-state actors in climate change risk management. In so doing, interventions will support the establishment of ***an appropriate framework that will support Dominica's transformation to a low-carbon climate resilience pathway that can serve as a model for other small island developing States.*** By recognising that climate change is a development issue rather than an environmental issue, **Dominica's *Low-Carbon Climate Resilient Strategy*** has the opportunity to demonstrate viable interventions to address climate change risks associated with Small Island developing States within the context of a national development framework that establishes the country firmly on the path to a Green Economy.

Interventions will be sustained in the long-term by ensuring that climate change becomes an ***integral part of the national development planning process***. Additionally, by establishing ***effective partnerships*** with all stakeholders (public sector and civil society, technical and financial partners, local governments, vulnerable communities, grass-roots organizations) to

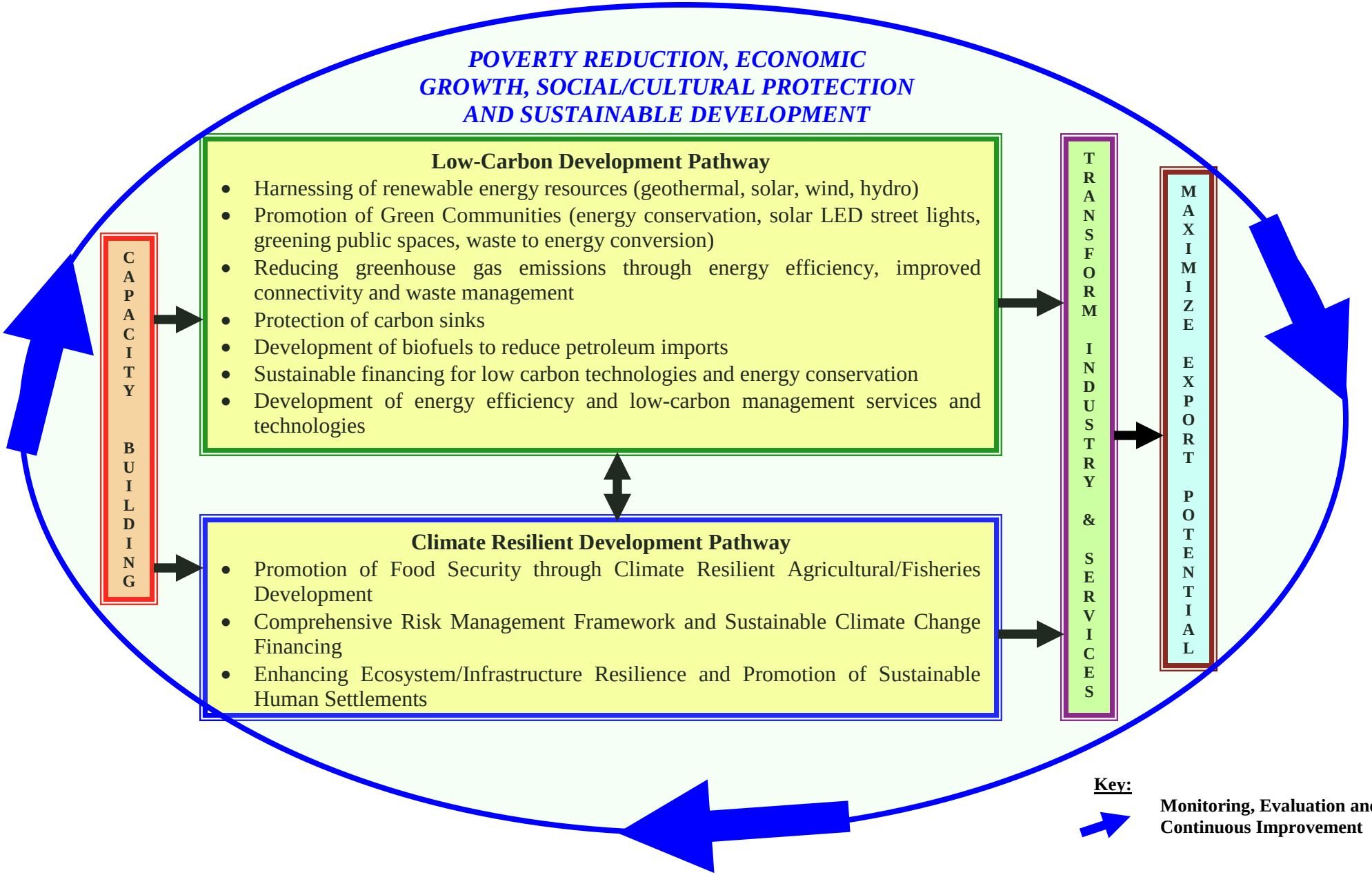
transform to a low-carbon climate resilient country that will make a significant contribution to sustainable development in Dominica, and add value by ensuring that this Strategy is not a stand-alone activity***, but is integrated into community, sectoral and national development policies and programs.***

7. Outline of Dominica's *Low-Carbon Climate-Resilient Development Strategy*:

The vision and key pillars of **Dominica's *Low-Carbon Climate Resilient Strategy*** are presented in the diagram on the following page.

DOMINICA'S *LOW-CARBON CLIMATE-RESILIENT DEVELOPMENT STRATEGY*

Key Pillars – Drawn from Dominica Medium-term Growth and Social Protection Strategy (GSPS)



The rapid increase in knowledge-based environmentally sustainable economic activity and the increasing pace of improvements in low carbon science and technology are fundamentally reshaping the country's priorities. Under the framework of **Dominica's *Low-Carbon Climate Resilient Strategy,*** the Government of Dominica is integrating green principles into national economic management and planning, and marring environmental preservation and management into the country strategy for achieving higher levels of sustained economic growth. With people being the country's most valuable resource, **Dominica's *Low-Carbon Climate Resilient Strategy*** is based on the principal objectives of:

- accessing appropriate low carbon and climate resilient technologies to support Dominica's continued transformation to the ***Greenest Economy in the Caribbean region***;
- building national capacity to support Dominica's continued transformation to a Green Economy;
- attracting a broader range of direct foreign investments in new green business opportunities;
- providing training to upgrade the skills of Dominica's workforce to fully exploit business opportunities (local and regional) in the Green Economy,

thereby maximizing high-skill employment opportunities required to support the continued transformation to a Green Economy. Considerable export opportunities will be afforded the skilled labour force working in Dominica's Green Economy as neighbouring Caribbean countries begin to explore their own low-carbon climate resilient development options.

Key component activities under **Dominica's *Low-Carbon Climate Resilient Strategy***, which are drawn from Dominica Medium-term Growth and Social Protection Strategy (GSPS), include:

Low-Carbon Development Pathway

- ***Development and commercialisation of geothermal resources***
  i. Undertake training on geothermal energy assessment, development and technologies
  ii. Develop inventory of geo-thermal resources
  iii. Assess viable geo-thermal technology options
  iv. Establish legislation to regulate the harnessing/export of geo-thermal energy
  v. Finance design and construction of geo-thermal power plant (est. 120 MW) and connection to electrical grid
  vi. Establish soft financing for community and small scale private geo-thermal plants.

- ***Harnessing of solar energy resources***
  i. Undertake training on solar energy conversions and technologies
  ii. Introduce incentives for conversion to solar heating in homes and public buildings
  iii. Evaluate viable photo-voltaic technology options for Dominica
  iv. Establish feed-in tariff for solar producers
  v. Finance design and construction of pilot solar power facility and connection to electrical grid
  vi. Establish soft financing for community and small scale private solar power conversions.

- ***Harnessing of wind energy resources***
  i. Undertake training on wind energy assessments, development and technologies
  ii. Development of Wind Atlas for Dominica
  iii. Establish Feed-in tariff for wind producers
  iv. Finance design and construction of wind farm on east coast and connection to electrical grid
  v. Establish soft financing for community and small scale private wind power conversions.

- ***Harnessing of hydro-power resources***
  i. Undertake training on hydro-power assessments, development and technologies
  ii. Development of inventory of hydro-energy potential in Dominica and assessment of commercial viability considering micro-hydro and run-of-river technologies
  iii. Establish Feed-in tariff for hydro-power producers
  iv. Finance pilot hydro-power plant and connection to electrical grid
  v. Establish soft financing for community and small scale hydro-power conversions.

- ***Promotion of Green Communities in Support of Health/Wellness***
  i. Undertake training on energy and greenhouse gas auditing, energy conservation and low-carbon technologies
  ii. Finance and commission energy/GHG audits of cities, public buildings, highway lighting
  iii. Establish soft financing for energy conservation and conversion to renewable energy technology including solar powered LED street lights
  iv. Establishment of green areas in urban development
  v. Undertake conversion of public buildings/infrastructure to low carbon technologies in Portsmouth
  vi. Establish vehicle upgrade and maintenance programs to phase in the conversion to fuel efficient and low carbon vehicles (solar powered, electrical, bio-fuel powered, hydrogen powered vehicles).

- ***Reducing greenhouse gas emissions through improved connectivity and waste management***
  i. Undertake greenhouse as audits of waste landfills
  ii. Upgrade roads to improve connectivity, reduce travel time and emissions from vehicles
  iii. Assess feasibility of appropriate waste-to energy technologies
  iv. Implement pilot waste to energy project in Roseau.

- ***Protection of carbon sinks***
  i. Provide training on forest/agricultural inventory procedures
  ii. Provide capacity building to Forestry Division to undertake forestry inventory to measure above and below ground carbon within forests and use of computer generated forest monitoring technologies
  iii. Undertake forest inventory
  iv. Determine carbon uptake of existing forest/agricultural lands and marine areas
  v. Assess viability of protecting additional forest/agricultural land and marine areas
  vi. Establish compensation framework to support protection of forest and agricultural land – particularly in buffer areas faced by encroachment or conversion

vii. Prevention of de-forestation for firewood;
viii. Protect new and additional carbon sinks

- ***Development of biofuels to reduce petroleum imports***
  i. Provide training on first and second generation biofuels technologies, processes and costs
  ii. Assess feasibility of viable first and second generation biofuel options for Dominica
  iii. Establish soft financing to facilitate start-up of pilot biofuel production
  iv. Establish supporting legislation to facilitate introduction of biofuels for vehicles and generators

- ***Sustainable financing for low carbon technologies and energy conservation***
  i. Provide training on climate change financing for private sector
  ii. Assess viable options to finance conversion to low-carbon technologies using market based instruments (carbon levy)
  iii. Design architecture for Climate Change Trust Fund to finance conversion to low-carbon technologies.
  iv. Legally establish Climate Change Trust Fund

- ***Development of low-carbon management services and technologies***
  i. Design and present training programs on energy auditing, greenhouse gas auditing, energy conversions, low-carbon technologies (installation and maintenance)
  ii. Establish standards and certification programs for low-energy appliances/equipment, energy auditing and greenhouse gas auditing
  iii. Promote professional certification of low-carbon management service/technology providers.

Climate Resilient Development Pathway

- ***Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development*** (US$5.5 million grant)
  (a) Development and implementation of ***Climate Resilient Agriculture/Fisheries and Food Security Management Program*** to facilitate -
  - Water resource inventory and development of water resource management plan to regulate harvesting, conservation and export of water;
  - Crop diversification program including organic production;
  - Land suitability and capability mapping to be integrated into the National Physical Development Plans of the Physical Planning Division (supported by CDB)
  - Promotion of improved crop varieties – e.g. drought and pest/disease resistant crops;
  - Changes in agricultural production systems – e.g. Organic, greenhouses;
  - New and improved appropriate agricultural technologies – e.g. irrigation powered by renewable low-carbon energy;
  - Protection of agricultural lands and fish nurseries;
  - Improved soil and land management;
  - Improved agricultural land use planning;
  - Agro-forestry for soil and watershed protection;

- Promote the sustainable utilization of non-timber forest products and sustainable wildlife farming;
- Increased agricultural/fishery productivity, value-added, and export;
- Improved sanitary and phyto-sanitary systems;
- Improved agricultural/fishery food quality, safety, standards;
- Self-sufficiency in food production and reversal of trend for farmers leaving the land and fisher folk leaving the sea;
- Promotion of local production rather than imported produce;
- Management of climate change impacts on farmer's/fisher folk health (heat stress, risks from extreme events, increase in water and vector borne disease, use of harmful chemical to control pests/diseases);
- ***Agricultural Information Management System*** - Applied research, agro-met stations and information systems, education, and monitoring to determine changes in agro-biodiversity, yield, physiology, productivity, marketing, extension services, data management.
- Establishment of ***Integrated coastal and watershed management plan*** and supporting institutional framework to protect marine resources and biodiversity;
- Transplanting and *restocking of climate resilient corals;*
- Research to determine species and site specific impacts of climate change on fisheries resources;
- *Aquaculture/ silviculture research and development* utilising renewable energy (solar, hydro, wind) *;*
- Marine product development and diversification – including alternate fishing methods/technologies;
- Institutional strengthening and climate risk *capacity building* within the fisheries sector (including fishing community in Kalinago territory) to facilitate shift to stakeholder management.

- ***Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing*** (US$5.5 million grant + US$4 million loan)

(a) Institutional strengthening and capacity building to effectively implement component activities, including:

- Legal establishment and institutional strengthening of Division of Environment, Climate Change and Development (DECCD) to coordinate effective implementation of Dominica's *Low-Carbon Climate-Resilient Development Strategy;*
- Develop *climate change risks management standards* – based on international quality or risk management standards – and pilot with private sector - tied to *capacity building for climate change risk assessment and management* in vulnerable private sector operations.

(b) Establishment of ***sustainable climate change and disaster risk financing mechanisms*** to support urgent priority interventions, including:

- *Climate Change Trust Fund* - external to government revenue – with funds raised from market-based instruments that will not raise the local tax base (e.g. carbon levy on energy use – possibly use portion of Petro Caribe deferred payment scheme on fuels (2% interest) EC$200 million accrued over 6 years with donors providing matching funds);

- *Micro-finance and micro-insurance* for farmers, fisher folk , private sector and vulnerable communities – including capacity building in financial institutions to manage climate change risks and delivery of climate change risks financing instruments – tied to climate change adaptation standards;
- *Climate change and disaster risk management insurance* for vulnerable businesses including tourism/agriculture/fisheries businesses and facilities;
- *Climate resilience small grants facility* (with a percentage set aside for Kalinago territory) to support priority climate resilience programs in vulnerable communities – supported by NGOs.

(c) US$4-9 million for micro-finance and micro-insurance for farmers, fisher folk, private sector and vulnerable communities, in particular the Kalinago people and women. (US$4 million loan)

- ***Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements*** (US$8 million grant+ US$85 million loans)

(a) Climate proofing of critical infrastructure, improving access to markets, and building climate resilient communities through:

- Construction of *coastal and river defences* - which is also a tourism product that addresses health and recreational impacts and beach enhancement;
- Slope stabilization, retrofitting primary and secondary roads and bridges;
- Improved transportation, processing, storage of agricultural/fisheries products and improved access to markets;
- Retro-fitting (climate proofing) houses, roads and critical infrastructure;
- Retro-fitting/construction of c*ommunity multi-purpose emergency shelters*;
- Establishment of c*ommunity-based early warning systems* (including for fishing communities) *and monitoring and community-based disaster management structures;*
- Implement and enforce *environmental protection legislation* and climate proofed building codes;
- Effective *waste and waste-water treatment management*;
- Improved *climate proofed drainage*;
- *Maintenance of storm water drainage*;
- *Increased water storage and treatment capacity* the latter using renewable energy technologies.

(c) Establishment of *Integrated Coastal Zone and Watershed Management Planning Framework* (to be integrated into National Physical Development Plan, supported by CDB) including:

- Inventory of surface and ground water resources, water balance assessment, continued monitoring of water resources, hydro-met monitoring stations (see also Component 1);
- Update soil map and natural resource inventory;
- Community-based vulnerability mapping and adaptation planning supported by community awareness programs;
- Central data-base to facilitate access of information to all users;
- *Zoning to ensure businesses are not built in vulnerable areas;*

- Land Use Zoning Plans / Land Management Plans to guide and control development in vulnerable areas
- Improve and implement *climate proof building codes* and develop effective monitoring capability to build resilience in the construction industry (and address informal buildings including through provisions attached to loans and mortgages) – backed by education and awareness at community level, legislation and effective enforcement / monitoring of the rate of coastal erosion
- Research, measurement and monitoring of *coastal data* (wave, current, sediment budgets, beach profiles)
- *Natural wind breaks and reduction of soil erosion through natural systems;*
- *Enhance protection of river banks and other protected areas;*
- Protection of water catchments areas.

(c) *Climate change risk management capacity building* in key infrastructure and water resource management agencies.

7.1. Financing Options

It is anticipated that priority interventions under **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** could be supported under the range of climate change financing that has come on stream in recent years, including:

Low-Carbon Development Pathway

GEF5 – US$4 million (grant)

REDD + - grant and loan
SREP- grant and loan
Green Climate Fund - grant and loan
SIDSDOCK
Multi-lateral/Bilateral Fast Start Climate Change Financing

Climate Resilient Development Pathway

Pilot Program for Climate Resilience (PPCR) – US$5-7 million (grant) + US$4-9 million (loan)
Adaptation Fund – US$10 million (grant)
IDA – US$17.5 million (loan)
Regional IDA – Up to US$35 million (max) (loan).
IBRD – US$20 million (loan)

It is anticipated that GEF5 will provide US$4 million (grant) to support enabling activities to commercialise geothermal energy, promote Green Communities, and determine technically viable biofuel options under the **Low-Carbon Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy.*** Additional support for investments under this pillar is to be negotiated with Development Partners. Investments to support the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** are outlined in section. 7.2.

7.2. Investments under Pilot Program for Climate Resilience (SPCR)

The following priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** will be supported under the US$7 million grant envelope available to Dominica under the Pilot Program for Climate Resilience (PPCR)**:**

- ***Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development***
  (a) US$2.5 million for:
    (i) US$2 million for inventory of surface and ground water resources, water balance assessment, continued monitoring of water resources, hydro-met and coastal monitoring stations (including US$800,000 for hydro-met and coastal monitoring equipment) to support development of ***Integrated Coastal and Water Resource Management Plan*** (see sub-component ii);
    (ii) US$0.5 million for development of ***Land Use Capability, Coastal Zone and Water Resource Management Plan*** and supporting legislation (as part of supporting mechanism for the National Physical Development Plan being developed with support from CDB) to regulate development in coastal and watershed areas, prevent pollution, regulate the extraction, conservation of water, and determine sustainable irrigation levels;

  (b) US$1 million to a food security program (to be implemented in coordination with Component 1 support under Adaptation Fund) involving:
    (i) US$0.75 million for the design and construction of a pilot rain-fed organic greenhouse, and organic food processing/storage facility utilising renewable energy sources to determine technical and financial viability;
    (ii) US$0.25 million for pilot transplanting and restocking of climate resilient corals to determine technical and financial viability with a view to replication in other critical coral reef areas.

- ***Component 2 - Comprehensive Risk Management Framework and Sustainable Climate Change Financing*** - US$2 million for capacity building including:
  (a) US$0.5 million legal establishment and initial (5 year) staffing of the Division of Environment, Climate Change and Development (DECCD);
  (b) US$0.2 million for the design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels;
  (c) US$0.2 building capacity training program in Ministry of Public Works to climate proof the design and construction of critical infrastructure including roads;
  (d) US$0.1 million establishment of the Climate Change Trust Fund;
  (e) US$ 1 million for the establishment of climate change adaptation standards.

- ***Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements*** - US$1.5 million to build climate change resilience in vulnerable communities, including through:

(a) US$0.5 million for community vulnerability mapping and adaptation planning for all Dominica (based on pilot process developed under SLM) which is integrated into National Physical Development Plan being developed with support from CDB;
(b) US$0.5 million for establishment of community early warning systems based on real-time hydro-met data;
(c) US$0.5 million for design, retrofitting/construction of at least three pilot multi-use climate resilient and energy efficient emergency shelters (one in Kalinago Territory) using appropriate traditional building methods and renewable energy sources, and build capacity to climate proof access roads to shelters – to serve as basis for building emergency multi-use shelters funded under IDA.

The following priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** will be supported under the US$9 million loan envelope available to Dominica under the Pilot Program for Climate Resilience (PPCR)**:**

- ***Components 1, 2 and 3*** – US$4-9 million for micro-finance and micro-insurance for farmers, fisher folk and vulnerable communities, in particular the Kalinago people and women. (40% of funding to be reserved for women, 10% for Kalinago, and 10% for organic farmers).

7. 3. Investments under Adaptation Fund

The following priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** will be supported under the US$10 million grant envelope available to Dominica under the Adaptation Fund:

- ***Component 1 - Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development***
  (a) Development and implementation of ***Climate Resilient Agriculture, Fisheries and Food Security Management Program*** to facilitate –
  - Harvesting, conservation and export of water;
  - Crop diversification program including organic production;
  - Promotion of improved crop varieties – e.g. drought and pest/disease resistant crops;
  - Changes in agricultural production systems – e.g. Organic, greenhouses;
  - New and improved appropriate agricultural technologies – e.g. irrigation powered by renewable low-carbon energy;
  - Improved transportation, processing, storage and access to markets;
  - Protection of agricultural lands and fish nurseries;
  - Improved soil and land management
  - Improved agricultural land use planning
  - Agro-forestry for soil protection;
  - Increased agricultural/fishery productivity, storage, value-added, and export;
  - Improved sanitary and phyto-sanitary systems;
  - Improved agricultural/fishery food quality, safety, standards;
  - Self-sufficiency in food production and reversal of trend for farmers leaving the land and fisher folk leaving the sea;

- Promotion of local production rather than imported produce;
- Management of climate change impacts on farmer's/fisher folk health (heat stress, risks from extreme events, increase in water and vector borne disease, use of harmful chemical to control pests/diseases);
- *Agricultural Information Management System* - Applied research, agro-met stations and information systems, education, and monitoring to determine changes in agro-biodiversity, yield, physiology, productivity, marketing, extension services, and data management.
- Establishment of *Integrated coastal and watershed management plan and supporting legal/institutional framework* to protect marine resources and biodiversity*;*
- Transplanting and *restocking of climate resilient corals;*
- Research to determine species and site specific impacts of climate change on fisheries resources;
- *Aquaculture/silviculture research and development;*
- Marine product development and diversification – including alternate fishing methods;
- *Climate resilience small grants facility* (with a percentage set aside for Kalinago territory) to support priority climate resilience programs in vulnerable communities – supported by NGOs.
- Institutional strengthening and climate risk *capacity building* within the fisheries sector (including fishing community in Kalinago territory) to facilitate shift to stakeholder management.

- ***Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements***

  Implementation of *Integrated Coastal and Watershed Management Planning Framework* and supporting legislation (developed under SPCR), including:
  - Update soil map and natural resource inventory;
  - Central data-base to facilitate access of information to all users;
  - *Land Use, Coastal Zone and Watershed Management Plans to control development in vulnerable areas,*
  - *Improve and climate proof building codes and develop effective monitoring capability within construction industry (also address informal buildings including through provisions attached to loans and mortgages)* – backed by education and awareness at community level, legislation and effective enforcement;
  - *Zoning to ensure businesses are not built in vulnerable areas;*
  - *Natural wind breaks and reduction of soil erosion through natural systems;*
  - *Enhance protection of river banks and other protected areas;*
  - Protection of water catchments areas;
  - Prevention of de-forestation for firewood;
  - Implement and enforce *environmental protection legislation* and climate proofed building codes;
  - *Climate change risk management capacity building* in physical planning, coastal and water resource management agencies.

7. 4. Investments under IDA, Regional IDA, and IBRD Support

The following priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** will be supported under **PPCR** (US$5 million loan), **IDA** (US$17.5 million loan), **Regional IDA** (Up to US$35 million (max) loan), and **IBRD** support (US$20 million loan) in addition to the US$0.5 million (grant) for IDA project preparation activities and US$0.1 million (grant) for Phase 1 PPCR preparation activities:

- ***Component 3 - Enhancing Ecosystem/Infrastructure Resilience and Promotion of Sustainable Human Settlements***

  (a) US$0.6 million (grant) to identify vulnerable infrastructure, evaluate technical solutions to address risks, improve and implement climate proof building codes and develop effective monitoring capability to build climate proof structures in the construction industry.

  (b) Climate proofing of critical infrastructure, improving access to markets, and building climate resilient communities through:
  - Integration of climate change considerations into national building codes and engineering design criteria;
  - Construction of *coastal and river defences* - which are also a tourism product that addresses health and recreational impacts and beach enhancement;
  - Improved transportation, processing, storage of agricultural/fisheries products and improved access to markets;
  - Slope stabilization, retrofitting and *climate proofing primary and secondary roads and bridges*;
  - Retro-fitting (climate proofing) houses, public buildings, and critical infrastructure;
  - Construction of c*ommunity multi-purpose emergency shelters*;
  - Effective and climate resilient *waste and waste-water treatment management*;
  - Improved *climate resilient drainage*;
  - *Maintenance of storm water drainage*;
  - *Increased water storage and treatment capacity* the latter using renewable energy technologies.

8. Summaries of Investments

Detailed summaries of the investments outlined in **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** (including implementation modalities) are provided in the compendium annexed to this Strategy.

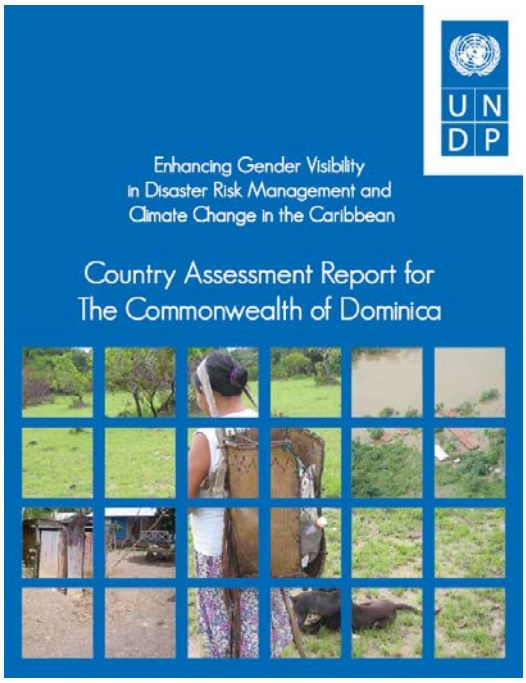
9. Gender and Climate Change

The report, *Enhancing Gender Visibility in Disaster Risk Management and Climate Change in the Caribbean - Country Assessment Report for the Commonwealth of Dominica* prepared by the UNDP in 2009, provides insights on the extent to which mechanisms for climate change risk management effectively incorporate gender considerations. The study highlights key measures

that are required to achieve gender equality in climate change risk management in Dominica which is fundamental for the survival and well-being of the country's population. It also supports the development of better public policies for climate change risk management in Dominica that can help key stakeholders to anticipate and prevent the differentiated impact of hazards on each woman and other vulnerable segments of society.

The effect of climate change and the increase in frequency of natural hazards is one of the most urgent issues currently impacting Dominica's social and economic development. Women in Dominica constitute the majority of the country's poorest persons. In spite of the many advances that they have made over the last century, they still have unequal economic and social status which makes them particularly vulnerable to the impact of natural hazards. Their unequal position in the labour market also makes their recovery from disasters more difficult. These and other factors need to be addressed in disaster risk management and planning. The relevant institutions have not integrated gender into disaster risk management, and this will have a negative impact on national development.
Enhancing Gender Visibility in Disaster Risk Management and Climate Change in the Caribbean - Country Assessment Report for the Commonwealth of Dominica. UNDP (2009).

The study showed that approximately 40 percent of the poor households were multi-generational (three generations living together) or had extended family relationships including in-laws and/or siblings. This meant that female heads of households had considerable responsibility for a large number of persons in their households. In general, poverty rates are higher for women, and among the poorest there is a high incidence of female headed households. The level of poverty in the rural areas and especially among the indigenous Kalinago is also a major concern. Most men and women in the Kalinago community are involved in subsistence farming and fishing as their primary occupation.



The report confirmed that women are often more severely affected than men by disasters associated with climate change. Data showed that when there is notice of an impending natural hazard, the preparations made by women usually include the storing of water, stocking up on non-perishable food items and essential medical supplies, as well as securing their houses and property. In households where there are male partners, men are actively involved in the disaster preparations. However, in female-headed households, single women, their children and the elderly are more vulnerable since they have to rely on assistance from their immediate community to undertake the urgent preparations.

The report includes recommendations to address the vulnerability of women to climate change impacts, including the construction of community emergency shelters, training in vulnerability assessment and risk management, and the provision of social safety nets in the form of micro-

finance and micro-insurance to assist women in rebuilding their homes, businesses and lives after an extreme event. These recommendations are being addressed as priority investments under the **Climate Resilient Development Pathway** pillar of **Dominica's *Low-Carbon Climate-Resilient Development Strategy.***

10. Implementation

Effective implementation of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** will be coordinated by the Council for Environment, Climate Change and Development (CECCD) that is to be legally established under the proposed *Environment, Climate Change and Development Bill* that is being develeoped through broad-based consultation and which is to be presented for enactment before the end of 2012. The Council for Environment, Climate Change and Development, to be co-chaired by the Prime Minister and the Minister for Environment, Physical Planning, Natural Resources and Fisheries, is a high-level coordinating body with responsibility to:

- Provide coordination, guidance and direction for the formulation and implementation of climate change-related policies;
- Provide guidance for the integration of climate change-related aspects in national policies, perspective plans and programmes;
- Take necessary measures to integrate climate change into the national development agenda;
- Initiate and coordinate activities related to additional financial and technical support to climate change-related programme and projects; and
- Initiate and coordinate measures to achieve additional benefits from climate change-related international negotiations and decisions.

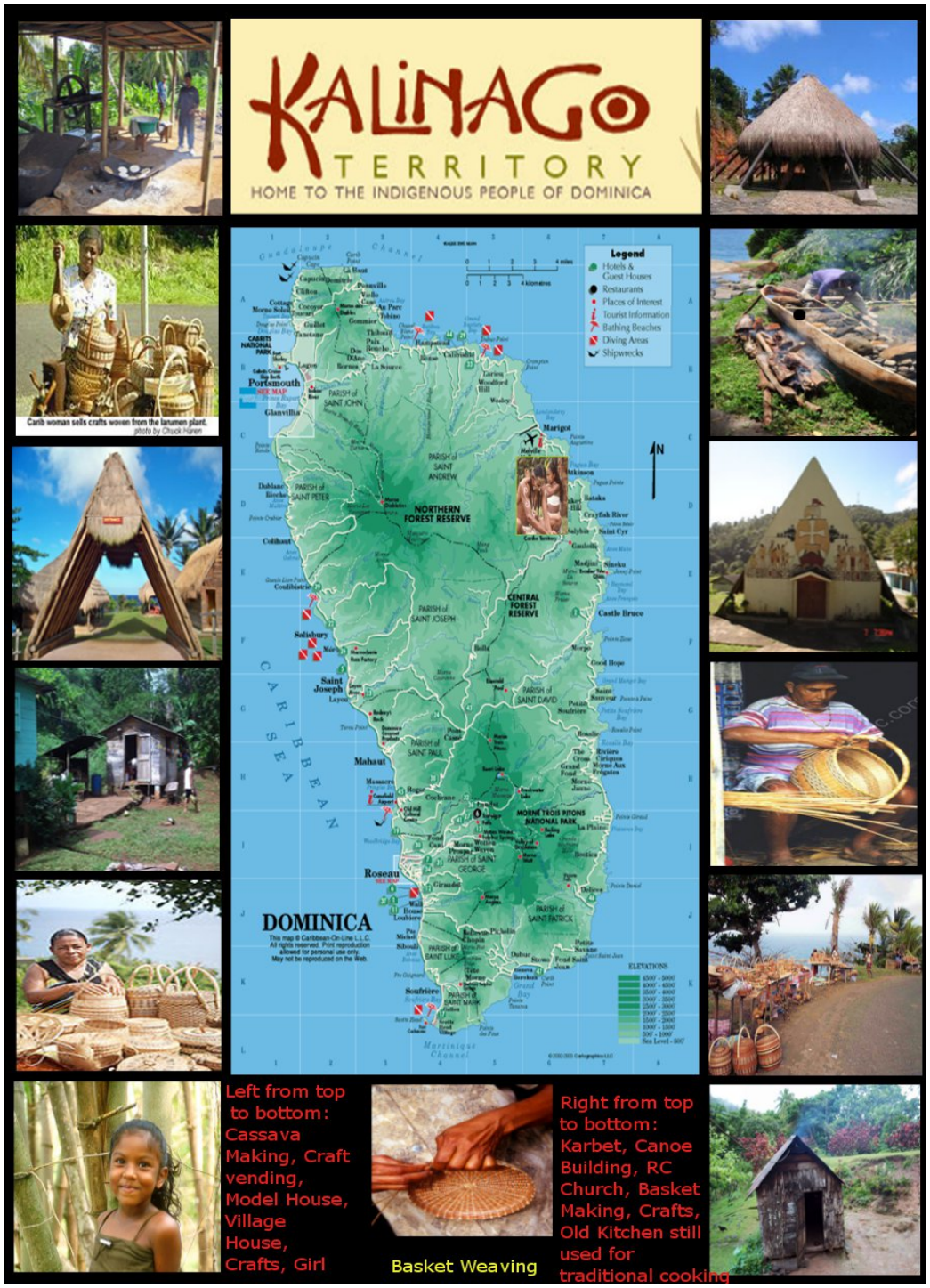
The Division for Environment, Climate Change and Development (DECCD) (formerly the ECU) that is to be legally established under the proposed *Environment, Climate Change and Development Bill* will function as the Secretariat of the Council, and will be tasked with the day-to-day technical coordination of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** in collaboration with the Ministry of Finance and other implementing agencies. DECCD will work through various line agencies and organisations at the municipal, district and community levels to deliver, monitor, and report on climate change programs under the Strategy.

The DECCD will report to the Council for Environment, Climate Change and Development (CECCD) to provide regular reports on implementation and administration of **Dominica's *Low-Carbon Climate-Resilient Development Strategy***. The Technical Working Group (TWG) for Climate Change, comprised of technical experts from government, private sector, NGOs and statutory boards, and the working level focal points (DECCD and Ministry of Finance) will provide technical input during implementation of the Strategy from other ministries at the working level. This will ensure that non-State actors, such as civil society and private sector, are able to fully participate and are actively engaged in the implementation of **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** thereby facilitating a significant shift in mainstreaming activities to civil society.

Like the GSPS, **Dominica's *Low-Carbon Climate-Resilient Development Strategy*** is a revolving Stratregy that will be regularly updated by the CECCD to ensure that it is kept current and revised to address changing circumstances.

ANNEX – CLIMATE CHANGE AND THE KALINAGO PEOPLE OF DOMINICA

(Prepared by representatives of the Kalinago People, including Hon. Ashton Graneau, Minister of Carib Affairs and Parliamentary Representative of Kalinago Territory, Mrs. Sylvanie Burton-Green, Permanent Secretary, Ministry of Carib Affairs, Mr. Garnette Joseph, Carib (Kalinago) Chief, Mrs. Josephine Dublin-Prince, President Dominica National Council of Women, and Lolell Williams)



CLIMATE CHANGE AND THE KALINAGO OF DOMINICA

Background

The Carib (Kalinago) Territory is situated on the North East of the Commonwealth of Dominica, located between two villages Atkinson to the North and Castle Bruce to the South, and occupies an area of 289.8sq.miles comprising eight hamlets namely: Bataca, Crayfish River, Salybia, St.Cyr, Gaulette River, Seneku, Mahaut River and Concord. The population is approximately two thousand people (2001 census) who are the remaining survivors of the first inhabitants of the island who have lived on this Island for over five hundred years, since the arrival of Christopher Columbus on 3rd November 1493. Before the arrival of Christopher Columbus, the Caribs spoke their own language and had their own religious practices. The Caribs (Kalinago) called the islands Waitukubuli, which means "Tall is her body", and they call themselves "Kalinago".

The Kalinago, a self-reliant people, are farmers and fisher folk, growing a variety of agricultural produce, including root crops which they use for food consumption and the excess are sold. They also grow 'manioc'(cassava) which is used to make farine and cassava bread, fish and hunt which contribute to the family diet. The Kalinago are skilled crafts people and make canoes, which are used for fishing and traveling around the island. They are famous for their herbal medicine and also for basket-making.

The land in the Carib Territory is communally owned, no one has individual land title, except the Roman Catholic Church which was granted 14 acres of land by the British Government. There is a Carib (Kalinago) Council, elected every five years and has the responsibility to overseer the Territory and has ownership of the land vested by the *Carib Reserve Act* of 1978. The Council comprises of the Chief and six other members and is under the portfolio of the Local Government of Dominica. The Ministry of Carib Affairs, headed by a representative from the Carib (Kalinago) constituency, is the principal Ministry of Government responsible for Carib affairs.

Vulnerability

The Caribs (Kalinago), the First nations' people of Dominica are struggling for survival, having lost their language, their religious practices and constantly battling to maintain their traditions, customs and identity. Under constant pressure to adopt modern practices, the Kalinago have managed to retain key aspects of their culture such as canoe building, basket weaving and are still famous for their traditional medicine and the making of cassava bread.

The Carib people through its history and rich cultural heritage have contributed considerably to the Tourism Industry, and by extension, the economy of Dominica which is the only island in the Caribbean with a Carib Territory. Carib crafts are displayed practically in every tourist shop in the island and the wider Caribbean. Traditions and cultures of the Kalinago are portrayed on cards, magazines, brochures, and other tourism promotional materials.

Unfortunately, the Carib Territory is still one of the poorest communities in Dominica. The major constraint to development faced by the people is the inability to access finance from financial institutions since there is no certificate of title that can be used as collateral. Therefore,

finance is not readily available to undertake priority projects such as housing, higher education, and human resource development.

The Carib Territory is still very much engaged in farming and fishing, with agriculture and craft production being the main economic generating activities. The Territory was once one of the largest Banana producing areas in Dominica, but due to the collapse of the industry farmers were forced to seek alternatives, such as root crops which are sold at the Roseau market or to hucksters. Some Kalinago have moved away from the traditional ways and have found employment in the tourist industry in such areas as tour guides, taxi drivers, and hoteliers. The majority of women are now more involved in vending of crafts. The construction of 'Kalinago Barona Auto', a traditional Carib Model Village, forms part of the organized tour sites and has contributed to employment and income for the Kalinago people.

Fishing, a Carib tradition, which has been contributing significantly to the diet, is now on the decline and persons are becoming more dependent on imported goods. The once brave sea-faring Kalinago men today do not even have a landing site to haul their canoes since the site was destroyed by hurricane David in 1979. The Marigot Fisheries Complex caters for fishermen in the Carib Territory, but fishermen have to travel approximately twelve miles to access this facility. This exercise is costly and time consuming. In some cases fishermen have to make the journey on foot. There are no resources to construct a small landing site for the family man who wants only to maintain his family diet. The Kalinago also face difficulties in obtaining finance for small boats, outboard motors and fishing. This has also caused the young generation to lose interest in the fishing and boat making tradition, and increased threats to food security within the Kalinago Territory. .

It has been recognized that education is the key to poverty alleviation in the Kalinago Territory, and much is being done in this area. There are Pre-schools for early childhood education, and Primary schools. A modern Primary school complex was built and opened on 31st May 2010. Although there is no Secondary School, students are able to access secondary education in the neighbouring villages of Marigot, Londonderry and Castle Bruce. The distance is far but due to the Government bus service more students are now able to access secondary education.

There are two Health Centres in the Carib Territory, but residents can also access the services of Atkinson and Castle Bruce Health Centres. Last year 10th August 2010 witnessed a major achievement in the Carib Territory when the doors of a state-of-art mini hospital were opened in Salybia. This was made possible from funds from donor agencies, friends and free labour by the Carib Community. However, there is no ambulance service in the Kalinago Territory and no disaster shelters.

Although there is a pipe-borne water system available many households are still without water, mainly because of the distance of taking water from the main pipe to the individual homes and the cost involved. Hence, some residents still carry water from springs and water-holes and rain-water; which is not a healthy practice.

Like most Indigenous peoples world- wide, the Carib Territory is faced with challenges of social ills. There are school drop-outs, teenage pregnancy, and alcohol and drug abuse. These are as

a result of lack of moral values, parental guidance, low self- esteem, and unemployment. Steps are being taken to arrest this situation.

Climate Change and Its Impacts on the Kalinago Territory

With limited resources at their disposal to respond, and with their traditional resilient culture under threat, the Kalinago consider climate change to be an overwhelming phenomenon. Its effects are numerous with far reaching consequences. The majority of Kalinago are convinced that the change in climate is mainly as a result of human practices contributing to an increase in emissions of green houses, including the burning of fossil fuel. They are aware of the effects of climate change such as changes in temperature and precipitation, the increase in the frequency of extreme weather conditions, ocean acidification with the risk of profound impacts on marine ecosystems and societies which depend on them. Droughts, flooding, rise in sea level, soil erosion, land slippage etc. all impact negatively on human, plants, animal and marine life.

The effects of climate change have for some years impacted negatively on the lives and livelihood of the Kalinago people. The unseasonal heavy rain-falls in late 2011 have caused major land movement resulting in landslides and land slippage in various areas of the community, and severe cracks in access roads and houses causing considerable disruption to the daily lives of a number of families.

Climate Change will affect the Kalinago community in different aspects, including impacts on health, education, income, culture and traditional customs. The Kalinago people are traditional farmers and depend largely on the land and sea for their survival and sustainability. Climate change impacts contributing to deforestation, land degradation, droughts, landslides, soil erosion and the depletion of the top-soil of major producing areas will all contribute in the reduction of the production of food crops so essential for providing the daily meals for Kalinago families and add to growing concerns over food security within the Territory.

The effects on marine life due to ocean warming rise in sea level, damage to the landing sites and coastal areas, and river overflow will cause a drop in fish production and consumption, impacting on the nutritional diet and the health of the people. Most affected will be the children and the elderly.

The production of Manioc (cassava) and toloman a traditional food crop will be compromised. The Larouman, which is the raw material for the production of craft items, such as basket-making, mats, and other forms of craft are under threat, since the land for growing it is either unavailable or barren. The entire hydrological cycle of the Kalinago Territory is being affected as a result of climate change.

Climate Change and Gender

Kalinago women will be the ones affected most by climate change given their roles in the family. Being the care-givers, food producers and the leaders in family management, Kalinago women play a significant role in the development of the family. Climate change will cause interruption to planting and harvesting cycles which will affect women's' livelihood, thus putting the household and food security at risk and pushing them into greater poverty. Because of droughts, resulting in the lack of water for irrigation purposes, there will be a decrease in vegetable production.

The social life and family structure will also be affected as the men/husbands will have to seek employment elsewhere to maintain their family, leaving the mothers and wives alone to care for the children. Kalinago women will have to work harder, restless, and suffer from fatigue, thus increasing stress levels which will consequently affect health. Kalinago children will also be affected as they may have to assist more in the homes, resulting in less time for study and school work and even increasing school absenteeism. Work-loads will increase as the children may have to assist in carrying ever scarce water from the river, springs etc., and also travel further to gather wood for the fire which is still largely practiced in the community. Children will be more tired, less able to concentrate on school work, hence a drop in their performance.

With climate change likely to result in an increase in water-borne and vector-borne diseases, the health of Kalinago families will also be affected. Impacts from climate change will present threats to safe drinking water, since many households still access water from the rivers, water-holes and from the rain, drinking water can become contaminated from increased sedimentation and water- borne diseases becoming less wholesome and unsuitable for domestic use. Threats from climate change to food production in the Kalinago Territory will affect the availability of wholesome food, in particular fish protein in the diet.

Climate change will also impact on the culture and traditions of the Kalinago community. Food shortage will cause families to divert from their traditional habits and depend on imported food. There will be a dwindling of basket weaving and craft production since there may not be sufficient raw materials to continue this tradition. Traditional herbal gardens will be affected since there will not be enough water to irrigate the plants during drought events, or too much water during events of heavy rainfall causing disease and damage.

Most importantly, climate change will have severe impacts for the Kalinago people due to the vulnerability of the community. The entire way of life and culture of the Kalinago is under threat from climate change, with impacts on the Territories economy and natural resources resulting in increased poverty and hardship.

Priority Measures for Kalinago People to Adapt to the Impacts of Climate Change

The Kalinago people of Dominica believe that the following priority measures are required to address climate change threats to the people, culture, livelihoods and existence of the Kalinago Territory:

- Design and implement wide-spread education and awareness program to sensitize the Kalinago people on climate change risks and measures to address these risks;
- Establish a climate change 'easy access trust fund' specifically for the Kalinago people to assist in climate change measures to address threats to agriculture production, fishing and food security;
- Construct community disaster shelters to house persons in time of disaster;
- Identify and build a landing site in the Territory for the fishermen who are unable to travel to Marigot and desperately want to maintain their families;
- Provide training in food preservation and water management;
- Measures to address impacts on the resilience of natural resources should be established, for example, planting of fast growing trees in affected areas, and grass that can lessen the impact of soil erosion, and trees planted to form wind breaks around the houses;
- Prevent the construction of houses and roads in vulnerable areas and ensure buildings comply with the building codes;
- Provide training on climate change risk management measures.

ADVANCE COPY

MINUTE PAPER NO.

SECRET

continued.

IN THE CABINET ON: TUESDAY 11TH APRIL, 2012

DOMINICA'S LOW-CARBON CLIMATE RESILLIENT DEVELOPMENT STRATEGY AND ITS STRATEGIC PROGRAMME ON CLIMATE RESILLIENCE (SPCR) SECOND JOINT MISSION

(Paper 0203/2012)

ENRPP&F; FINANCE

Further to Cabinet Decision No 0293 (i) of Tuesday 20th March, 2012, Cabinet advised approval of the Low-Carbon Climate Resilient Development Strategy.

THE PRIME MINISTER DIRECTED ACCORDINGLY

STEVE FERROL
SECRETARY TO THE CABINET

APRIL 11, 2012