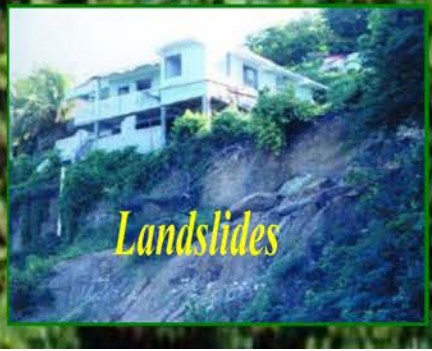
CIF Climate Investment Funds

DOMINICA

STRATEGIC PROGRAM FOR CLIMATE-RESILIENCE (SPCR)

2012-2017



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- Agriculture and Food Security
- Fisheries
- Water Resources
- Disasters, Human Settlements and Infrastructure
- Private Sector
- Household and Community Vulnerability Study

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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 incorporates 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, various 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. RATIONALE 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:

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[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 *Addressing gender issues* – the vulnerability of women and other vulnerable groups was a key determinant in adopting the focus on vulnerable communities, as identified within the Household and Vulnerability Communities Survey; that is the cornerstone of Dominica's SPCR. As indicated in Dominica's *Low Carbon Climate Resilient Development Strategy* which is a compendium document to the SPCR, the key measures required to address the vulnerability of women to climate change impacts include 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 SPCR. Additionally, the needs of women have been taken into account in structuring access to the Climate Change Trust Fund (40% to be reserved for women) and will be taken into consideration in establishing micro-financing and micro-insurance programs. Specific indicators concerning gender issues will be more explicitly developed during upcoming stages of preparatory work prior to SPCR implementation.

11. *Micro-insurance and micro-finance* – A demand for micro-finance and micro-insurance has been voiced by Dominica's private sector, farming and fishing communities after each extreme event that has struck the island in recent years, but access to resources has prevented the Government from establishing any such program in a meaningful manner. A detailed evaluation and consultation with the banking and insurance sector will be undertaken during the next stage of SPCR preparation to determine the scope of such financing regime, sustainable funding options, the most viable operational structures, and the mechanisms for establishment and effective operation. This evaluation will be guided by:

(a) the study on the *Demand for Weather-related Insurance and Risk Management Approaches in the Caribbean* conducted by GIZ/MCII in four Caribbean countries (Belize, Grenada Jamaica, and St. Lucia) with funding from the German *Federal Ministry for Economic Cooperation and Development* (BMZ), and
(b) the *Climate Risk Adaptation and Insurance in the Caribbean (Jamaica, St. Lucia, Grenada, Belize and Guyana)* program implemented by the *Munich Climate Insurance Initiative* (MCII) and hosted at the *United Nations University Institute for Environment and Human Security* (UNU-EHS) financed by the *Federal Ministry for the Environment, Nature Conservation and Nuclear Safety* (BMU).

12. 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.

13. 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.

14. 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

15. 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.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

[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.

21. As part of the NCSA process, 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.

22. 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.

23. 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.

24. 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.

25. 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

26. 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*[1] in addition to US$1 million seed funding to the *Climate Change Trust Fund* to provide support to priority community climate change risk 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.

[1] *Governance and management structure plus a fall back option for the Climate Change Trust Fund* – The structure, scope, *o*perational modalities, and sustainable financing options (including fallback position) for the Climate Change Trust Fund will be defined during upcoming stages of preparatory work and will be guided by support provided by UNDP in establishing such Trust Funds (see - *Blending Climate Finance Through National Climate Funds A Guidebook for the Design and Establishment of National Funds to Achieve Climate Change Priorities*. UNDP, 2011). The Government of Dominica would also seek to benefit from best practices established through German support of the *Indonesia Climate Change Trust Fund* (ICCTF), under which GIZ and KfW Development Bank advised the Indonesian *Ministry of National Development Planning* and the *Ministry of Finance* in key areas including establishing: (a) the legal basis of a nationally-managed trust fund, (b) the standard operating procedures for the selection of adaptation measures to be supported under the Trust Fund, (c) the establishment of a technical counselling centre for project applicants under the Trust Fund, and (d) the establishment of a fund tranche for the private sector. *Synergies with German Climate Change Related Engagement in the Country / Region* – Close cooperation with projects funded by the Federal Ministry for Economic Cooperation and Development (BMZ) which are currently under development will be established during upcoming stages of preparatory work prior to SPCR implementation.

VI. Budget

27. 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**

28. * 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.

29. 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

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*."

30. It is recognised that within the amount of PPCR funding that is being made available to Dominica that there are limited opportunities to providing benefits to local communities. However, vulnerable communities will be the direct beneficiaries of key component activities, including, but not limited to, improved land use planning which will prevent the location of houses and critical community infrastructure in vulnerable areas under Component 1 and improved access to water resources for agricultural production for remote communities under Component 1. Another essential activity under Component 1 is improving food security through the community-level participation in the demonstration and replication of pilot community-based climate-resilient agricultural programs and community coral reef restocking programs. Under Component 2, training to undertake the development of community-based vulnerability maps and community adaptation plans as well as ensuring access to micro-finance and micro-insurance to address risks from climate change are critical. The establishment of community early warning and preparedness systems based on real-time data from hydro-met and coastal monitoring stations, is a key activity under Component 3. Another major activities under this component are the construction of

community emergency shelters and the identification and climate proofing of vulnerable community infrastructure. Should additional PPCR resources be made available, the Government of Dominica will increase the resources in the *Climate Change Trust Fund* (now 1 million US$) to directly provide resources for adaptation measures for vulnerable communities;

VII. Synergies/Linkages - National and Regional Track PPCR

31. 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.

32. 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.

33. 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.

34. 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 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 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 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	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;

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. Legal establishment of the Climate Change Trust Fund and seed funding to support financing of priority climate change risks management measures by private sector and at community level. 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.	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 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.

35. 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

36. Governance and management – The SPCR will be managed and coordinated as a collaborative initiative between the Environmental Coordinating Unit (ECU) of the Ministry of Environment, Physical Planning, Natural Resources and Fisheries, and the Ministry of Finance, with technical coordination being provided by the ECU under the fiduciary management of the Ministry of Finance. PPCR Technical working groups will be maintained and new ones deemed appropriate will convened by the ECU to manage and coordinate the day-to-day implementation of individual component activities, under the overall guidance of the multi-stakeholder SPCR Coordinating Committee which has broad-based representation from government agencies, the

private sector, non-governmental organisations (NGOs), women's groups, Kalinago peoples and youth. This governance and management framework has guided and coordinated the successful implementation of a number of complex multi-disciplinary and multi-stakeholder projects and programs in Dominica, and has established a sound working structure that will be embodied in the proposed environmental legislation that is under development.

37. *Stakeholder roles and responsibilities within the different components* - Individual stakeholder roles and responsibilities under each component and the overall SPCR program will be defined during upcoming stages of preparatory work within the overall governance and management structure outlined above;

Technical and Administrative Support Required for the Sustainable Execution of the SPCR

This support is required to facilitate informed, timely and efficient implementation of SPCR. In the first instance, the climate change coordinator/specialist will be involved in the preparation process for the SPCR. Overall, the coordinator is expected to undertake various activities, in collaboration with, and under the supervision of, the Environmental Coordinating Unit and the Ministry of Finance.

The implementation of PPCR resources in Dominica will be led by the Ministry of Finance in close collaboration with the Environmental Coordinating Unit (UNFCCC Focal Point) of the Ministry of Environment, Natural Resources, Physical Planning and Fisheries. In order to meet World Bank fiduciary requirements, a Project Implementation Unit (PIU) will be procured and housed within the Ministry of Finance to take the lead on the preparation and implementation of PPCR investments. The Ministry of Finance, in close collaboration with the Environmental Coordinating Unit of the Ministry of Environment, Natural Resources, Physical Planning and Fisheries will be responsible for overall coordination of SPCR implementation across Government, and for overall PPCR monitoring and oversight.

Funding made available under Component two of the SPCR will address the issue of technical support positions to ensure the timely and efficient coordination and implementation. Managing climate change programming is an additional responsibility, the incremental cost of which, in keeping with the agreements under the UNFCCC, should not be a cost borne by only Dominica in the first instance but by programmes such as the SPCR. It is anticipated that once the value of improved climate change programming and coordination has been demonstrated during the SPCR implementation, the government of Dominica will mobilize the necessary resources to ensure continuity. The Government commits and will undertaken a mid-term review and will identify and establish funding sources to sustain the operations of the climate change staffing positions once the SPCR program has been completed.

38. 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.

39. 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. Once established under the SPPCR programs, 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.

40. 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.

41. 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.

42. 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.

43. 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.

44. Individual stakeholder roles and responsibilities under each component and the overall SPCR program will be defined during upcoming stages of preparatory work within the overall governance and management structure outlined above.

IX. Role of World Bank

45. 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.

46. 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. UNDP Engagement in Capacity Development

47. As indicated Dominica is challenged and has also identified its considerable limitations in climate change risk management capacity at the systematic, institutional and individual levels, at the national, sector, district and local levels. These limitations also extend within the public sector and civil society, therefore highlighting the need for considerable capacity building. Dominica has worked closely on implementing several UNDP capacity development initiatives, UNDP, which is prepared and all ready to assist with its capacity development challenges, have tremendous in-house capacity, including the support of its Regional Technical Team in Panama and have worked in collaboration and consultation with regional and global experts. The approach in their engagement with Dominica's SPCR would be to use the expertise available to deliver the outputs at the same time will build the capacity on the ground, so that the skills and competences are mainstreamed into the development process. UNDP have done this successfully with the Sustainable Land Management project. Through its implementing agency which is the Environmental Coordinating Unit partnering with the Department of Physical Planning and other critical government agencies and representatives from local communities were trained in data collection and generation of community vulnerability maps. These ten (10) communities now have and acquire the knowledge of community specific maps and this has initiated the development of a national vulnerability atlas in a participatory manner. UNDP's capacity development is centered on people's empowerment to manage their development to build resilient communities. It is critical

that stakeholders on the ground are vested with the requisite skills necessary, if Dominica is to realize that social and economic transformation needed for its development thrust.

XI. Roles of other donors and international agencies

48. 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. Additional resources could be leveraged to scale up activities identified under the SPCR. Credit and loan resources under IDA, Regional IDA,and IBRD could be made available should the Government of Dominica request to access these funds through the World Bank.

XII. Adaptation Management Systems for the Private Sector

49. The SPCR aims to build a partnership framework of transformational within industry and services in order to maximize production and export potential through the integration of climate change resilience into national development processes, including those that engage other development entities such as the private sector. The SPCR will seek to build capacity to facilitate Dominica's transformation into a climate resilient economy that addresses priority climate change risk to the private sector in areas that relates to agriculture and food security, energy, tourism, water security and quality, banking and insurance. The recommended approach during the development of the SPCR was the establishment of a private sector technical working group chaired by Invest Dominica Authority, taking into consideration and capturing the critical role of the private sector in climate change adaptation management systems. An assessment on the various sectors related to climate change (tourism, banking/insurance, manufacturing industry, etc.) was undertaken. There are no existing studies on the impacts of climate change on the private sector with the exception of the tourism, energy and water sector, that which was undertaken during the development of the Initial National Communication on Climate Change and Policy on Adaptation to Climate Change. The private sector is still at an early stage in identifying and management of risk. There is a need for the private sector to look at climate change and disaster risk with the view of strengthening risk management capacity within businesses. There is the need for a more systematic and coordinated approach for the development of adaptation management systems for the private sector which should include procedures for monitoring outcomes. The private sector will also need to undertake a detailed value chain analysis to identify priority sectors with maximum potential and establish a documented policy and approach that will have maximum growth potential and transformational in nature. This will be achieved through the establishment, by the private sector, of comprehensive adaptation management standards under Component 2 which will be designed, developed, tested, and implemented by the private sector themselves working in collaboration with the Bureau of Standards. This will be pioneering work that has the potential to be replicated by the private sector in other countries.

XIII. Information Management

50. It is recognized that knowledge and data management, data collection and climate impacts assessment needs are similar across the region. In fact, all PPCR participating countries in the Caribbean have identified knowledge and data management and protocol as an urgent need. These activities will be based on a two-tier engagement-one at the national level and one at the regional. At the national level, institutional capacity will be strengthened to capture and share information within and between line ministries through an open-source model. At the regional level, regional organizations like the OECS and the CCCCC will promote regional cooperation through the creation of regional data sharing platforms and mechanisms to facilitate knowledge and data management, data collection needs as well as improved impact assessment. Various agencies in Dominica are engaged in collecting, monitoring and processing critical data required to support climate change impact modeling and analysis. These include agencies such as the Ministry of Agriculture and Forestry, Ministry of Environment, Natural Resources, Physical Planning and Fisheries, Ministry of Energy, Public Works, and Public Utilities, including its Meteorological Department, Central Statistical Office, Ministry of Health, Dominica Water and Sewerage Company (DOWASCO), Dominica Electricity Company (DOMLEC), Office of Disaster Management and others. Indeed, some agencies involved in the collection and management of climate-relevant data, such as the Meteorological Department, have benefited from climate change-related projects from previous years, such as under the CPACC Project.

51. An interagency inventory of data collection and management resources, as well as a comprehensive catalogue of current data holdings and subsequent data gap analysis will be developed to provide the basis for determining future areas requiring investment and support. This analysis will include the examination of supporting software, data management and distribution hardware and field instrumentation, as well as an assessment of current capacity and institutional strengthening needs. This activity will build upon the Technology Needs Assessment (2004) study which was conducted as part of enabling projects to build national capacity additional to the Initial National Communication and prior to the SNC. Once completed, this evaluation will produce the needs assessment and recommendations, which will serve as the basis for designing institutional strengthening and investment activities. During the conduct of a comprehensive analysis of current data available that is relevant to climate change adaptation programmes, data will be collected for storage in a common database for access and collaboration, as appropriate. Basic quality assessment of the data with regard to its applicability for climate change adaptation analysis will also be collected. Based on the evaluation and interaction with relevant data holders, input for future data management policies, protocols, procedures and standards will be provided.

52. The SPCR investments incorporate a commitment to improved data capture and analysis in particular geospatial, for improved management of physical planning and water resource management and sharing lessons in country and with regional initiatives. Progress of the SPCR implementation and lessons learned will be monitored and its activities will be documented on the SPCR website. Dominica will also develop and provide periodic reports to the CIF through instruments such as the CIFNet, pilot countries meetings and through engagement with other CARICOM countries under the SPCR regional track. Other medium for information dissemination will be through periodic workshops and focus group meetings such as, the various technical working groups, the council for environment, climate change and development that comprises of the committee of permanent secretaries, and also to the wider stakeholder community. More detail information on specific knowledge management activities will be explicitly developed during the upcoming stages of the preparatory work prior to the SPCR implementation.

XIV. Monitoring Framework: Impact, Outcome, and Outputs

53. 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.

54. *Indicators* - Under World Bank guidelines and operational requirements, project development objectives, project development indicators, activity indicators and yearly targets will be articulated in a project results framework with the Project Appraisal Document (PAD). The development of these indicators and targets are an integral part of the project identification, preparation and appraisal processes. The indicators and targets will comprise a combination of climate change adaptation and disaster risk management indicators. Indicators will be quantitative and qualitative in nature and be designed to be easily measured over the lifespan of the project.

55. Existing plans, strategies and policies – The governance and management framework that has guided and coordinated the successful implementation of a number of Dominica's plans, strategies and policies is to be utilized for SPCR implementation, while the success or limitations experienced in implementing such plans guided the development of Dominica's SPCR. Lessons learned from these experiences will continue to guide upcoming stages of preparatory work and SPCR implementation.

Part III – Request for Project Preparation Funding

56. 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

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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,

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[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. The structure, scope, *o*perational modalities, and sustainable financing options (including fall back position) for the Climate Change Trust Fund will be defined during upcoming stages of preparatory work and will be guided by support provided by UNDP in establishing such Trust Funds (see - *Blending Climate Finance Through National Climate Funds A Guidebook for the Design and Establishment of National Funds to Achieve Climate Change Priorities*. UNDP, 2011). The Government of Dominica would also seek to benefit from best practices established through German support of the *Indonesia Climate Change Trust Fund* (ICCTF), under which GIZ and KfW Development Bank advised the Indonesian *Ministry of National Development Planning* and the *Ministry of Finance* in key areas including establishing: (a) the legal basis of a nationally-managed trust fund, (b) the standard operating procedures for the selection of adaptation measures to be supported under the Trust Fund, (c) the establishment of a technical counselling centre for project applicants under the Trust Fund, and (d) the establishment of a fund tranche for the private sector. *Synergies with German Climate Change Related Engagement in the Country / Region* – Close cooperation with projects funded by the Federal Ministry for Economic Cooperation and Development (BMZ) which are currently under development will be established during upcoming stages of preparatory work prior to SPCR implementation. 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 6b

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

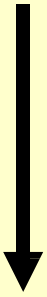
As stated above, Caribbean countries are more vulnerable to a changing climate than many other regions. Caribbean private sector therefore have a strong motivation to take the lead in developing and in implementing cost effective and practical tools to foster adaptation. Some argue that successful

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

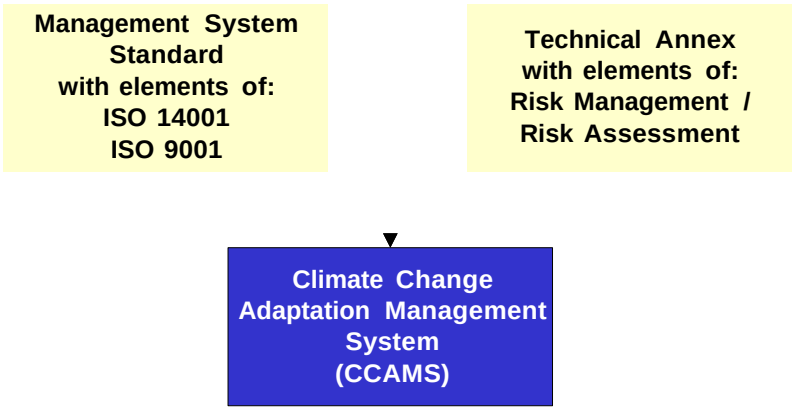
The proposed Climate Change Adaptation Management System (CCAMS) would consist of requirements and a technical annex. It is envisioned that the CCAMS will be designed to align with key requirements from the ISO 9001 and ISO 14001 standards with elements of risk analysis integrated into the resulting 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

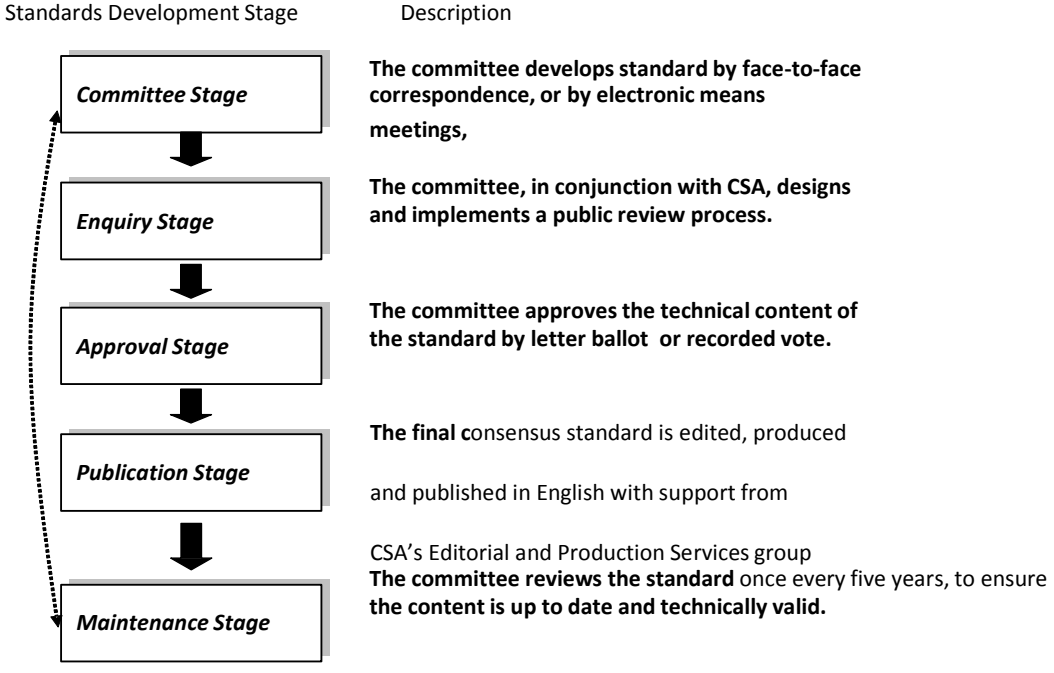
Phase 2 – Management System Development

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.

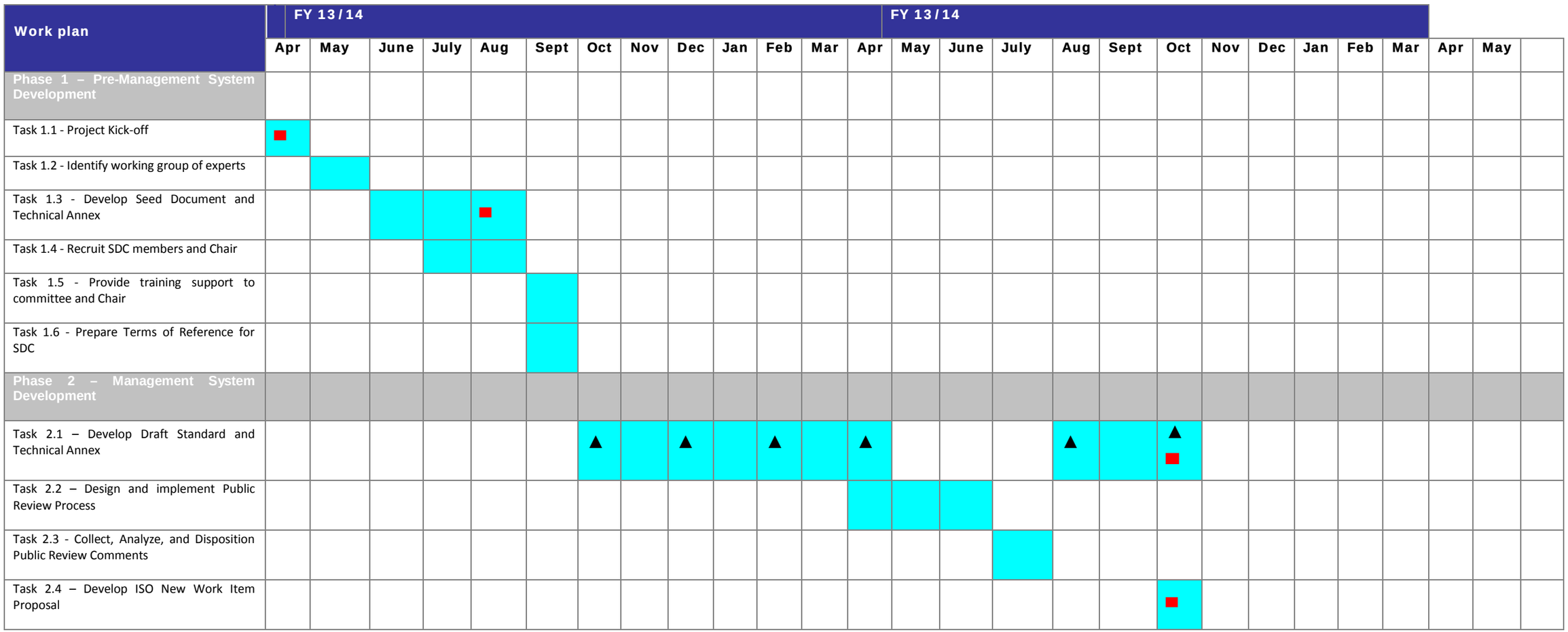
Since the 1992 U.N. Environment (Rio) Conference and Convention, many bodies such as the International Organization for Standardization (ISO) have been taking action and establishing increasingly important roles in the preparation and diffusion of new environmental tools, technical guidance and best 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 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.

I. 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 (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	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 (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
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.

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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 millior	
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.

Cooperation and coordination with the regional SPCR – upcoming project preparation activities for both Dominica's SPCR and the regional SPCR will be closely coordinated with a view to clarifying the cooperation and coordination between the two programs, both with regard to specific activities as well as with regard to mechanisms of cooperation (e.g. forms and frequency of exchange, scheduling and timing of inputs);

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.