



Strategic Programme for Climate Resilience

SAINT VINCENT AND THE GRENADINES PHASE TWO PROPOSAL Narrative

2 March 2011

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Abbreviations and Acronyms

CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community
CAS	Country Assistance Strategy
CCCCC	Caribbean Community Climate Change Centre
CDEMA	Caribbean Disaster Emergency Management Agency
CEHI	Caribbean Environmental Health Institute
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
CMO	Caribbean Meteorological Organization
DMP	Disaster Management Plan
EOC	Emergency Operations Center
ERDMP	Emergency Recovery and Disaster Management Project
FAO	Food and Agriculture Organization of the United Nations
FACRP	Fondes Amandes Community Reforestation Project
GEF	Global Environment Facility
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IIED	International Institute for Environment and Development
IFMDP	Integrated Forest Management and Development Programme
IPCC	Intergovernmental Panel on Climate Change
IWCAM	Integrating Watershed and Coastal Areas Management project
LFUG	Local Forest User Group (Saint Vincent and the Grenadines)
MTWH	Ministry of Transport, Works and Housing
NDC	National Disaster Coordinator
NEMO	National Emergency Management Office
NEMS	National Environment Management Strategy
NESDP	National Economic and Social Development Plan
NGO	Non-Governmental Organisations
NMS	National Meteorological Service
NPV	Net Present Value
OECS	Organization of Eastern Caribbean States
PCU	Project Coordination Unit
SLR	Sea level rise
SIDS	Small island developing states
SGD	St George's Declaration
SNC	Second National Communication
SPCR	Strategic Program for Climate Resilience
SVG	Saint Vincent and the Grenadines
TWG	Technical Working Group
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
UWI	University of the West Indies

Organization of the Documents

READ ME FIRST!

There are three separate documents that build on the structure established in the Phase One Proposal;

- Document 1. **SPCR Narrative,**
- Document 2. **Investment Programme,** and
- Document 3. **Supporting Resources** (Annexes for both documents).

- **INVESTMENT PROGRAMME**

The Investment Programme is the heart of the SPCR. The narrative and the supporting documentation provide critical background information and justification for the projects and programmes presented in the Investment Program. This document has three parts: i) a brief introduction, ii) one page detailed descriptions of each proposed investment project (including objectives, rationale, cost and expected outcomes/results), and iii) summary tables of all the investment projects grouped by the four components (see below).

- **FOUR COMPONENTS**

There are four Components (groups of proposed initiatives or investment projects) in the Investment Programme. The first Component (*Climate Vulnerability, Risk Assessments and Risk Reduction*) includes three Pilot Project Areas: one Grenadine island (Union Island), and two watersheds on Saint Vincent. These Pilot Areas are the sites for testing and modelling the implementation of the other three components (*Component 2: Data collection, analysis and information management, Component 3: Strengthening of existing policy, legal in institutional framework to address climate change, and Component 4: Design and implementation of a public education and capacity building programme*).

- **PARAGRAPH TITLES**

The main titles of the SPCR Narrative follow the recommended PPCR template. Under each of these headings, main paragraphs are given separate headings, shown in the Table of Contents.

- **PROJECT NUMBERS**

Each individual investment project in the Investment Programme is given a unique number. This creates a simple reference from the Narrative to projects in the Investment Programme. It is also a means of monitoring and ensuring the necessary discussions and justifications in the narrative match each project.

e.g. a project number 1.2 means project number two in Component One;

e.g. 4.6 means project number 6 in Component Four.

- **SUPPORTING RESOURCES**

This contains all relevant Annexes. If the material in an Annex does not have direct relevance to project components, it is not included. This material will be relevant for Phase II activities.

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SPCR Summary

PILOT PROGRAM FOR CLIMATE RESILIENCE Summary of Strategic Program for Climate Resilience		
1. Country/Region:	SAINT VINCENT AND THE GRENADINES CARIBBEAN REGIONAL PPCR	
2. PPCR Funding Request (in USD million):	<i>Loan: USDmillion\$3.0</i>	<i>Grant: USDmillion\$7.0</i>
3. National PPCR Focal Point:	<i>Laura Anthony-Browne, Director of Planning, Ministry of Finance and Economic Planning</i>	
4. National Implementing Agency (Coordination of Investment Strategy):	<i>Ministry of Finance and Economic Planning</i>	
5. Involved MDB	<i>The World Bank</i>	
6. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point: Kanta Kumari Rigaud</i>	<i>TTL: Niels Holm-Nielsen</i>

7. Description of SPCR:

Vision

The initiatives and investments proposed in the PPCR will jump-start the transformation of Saint Vincent and the Grenadines into climate resilient communities; an example to the OECS countries, to all of the Caribbean and indeed, small island states around the world. This is the vision and the PPCR is a leap forward in achieving that vision.

Approach of the SPCR

*As outlined in the Phase One Proposal, the SPCR has **two parts**; the SPCR Narrative (this document), and the Investment Programme (a separate document to which the narrative refers).*

*Based on the structure outlined in the Phase One Proposal, the Narrative has **four components**, which also provide the basic structure of the Investment Programme document. It provides objectives and rationale for the inclusion of each of the initiatives and investments included in the Investment Programme. An additional document titled ‘Supporting Resources’ includes the Annexes referred to in the SPCR below.*

*The key to the approach adopted in the SPCR and Investment Programme is the development of three site-specific vulnerable areas (two watersheds and one island) that will pilot the interventions recommended in the other three components. The three pilot areas will then **implement and test** a broad spectrum of interventions to build resilience in these three vulnerable areas. They will be **model comprehensive interventions**, to be extended in future to all the Grenadine islands and remaining Saint Vincent watersheds.*

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

- *Extreme concentrations of **population** and critical **infrastructure** along vulnerable coastlines on Saint Vincent and all the Grenadines. Coastal residents and businesses are vulnerable to significant loss or damage from extreme weather events, rising sea levels and storm surge.*
- *Sensitive **marine and coastal environments** in the Grenadines are under increasing **climatic and anthropogenic** (human) **stress** from lowering precipitation levels, increasing volume of recreational boating, inadequate urban drainage, poor solid waste disposal and other climate variables including sea surface temperatures and increasing extreme weather activity that threaten coral beds, reefs, sea grasses and marine ecosystems.*
- *Vulnerabilities are exacerbated by a lack of facility or expertise for basic **information and data** gathering, storage, access and knowledge management in general regarding climate change, and related disaster reduction topics. The need exists to build capacity and to develop a “culture of information” in Saint Vincent and the Grenadines.*
- *Level of **knowledge and awareness** of the potential impacts of a changing climate in urban, rural and island communities is low, thwarting a rapid transformation to a climate resilient population in Saint Vincent and the Grenadines. Technical **skills** in climate adaptation, resilience building, and disaster risk management are limited.*
- *Some important **legislative controls and guidelines** from statutory authorities require strengthening. Many are in a draft form, incomplete or outdated and require revision and updating to accommodate climate adaptation and resilience building components. Enforcement remains patchy. Strengthening these systems will reduce vulnerabilities and potential loss from climate and disaster impacts.*

(b) Areas of Intervention – sectors and themes

Following the activities described in the Phase One Proposal (September 2010), the following four components describe the main themes of proposed interventions for Phase Two. The vulnerable sectors identified include Water, Health, Environment (coastal and inland), Tourism, Agriculture, Fisheries, and Infrastructure. A multi-sectoral approach is embodied in the following four main areas of intervention:

Component 1: Climate Vulnerability, Risk Assessments and Risk Reduction

Component 2: Data Collection, Analysis and Information Management

Component 3: Strengthening of Existing Policy, Legal and Institutional Framework to Address Climate Change

Component 4: Design and Implementation of a Public Education and Capacity Building Programme

(c) Expected Outcomes from the Implementation of the SPCR

- **Less Vulnerable Communities**

A comprehensive program for climate resilience that includes key sectors and identified vulnerable groups, including women, children and the elderly, particularly those living along the coast, and especially those in the Red Zone (<5m or 16 feet above sea level). All residents and businesses in the Red Zone will receive basic hurricane awareness training, risk knowledge building, and receive essential vulnerability knowledge relevant to their communities. The assessment of gender sensitive social impacts and resulting action plans will be prepared for all constituencies including each of the Grenadines. Communities will be less vulnerable to climate change.

- **Lessons Learned and Risks Reduced**

Both adults and children will have a new and growing awareness of climate change and the impacts of climate on the social, environmental, and economic sectors of Saint Vincent and the Grenadines. The public education programme will add standard curriculum to schools, and every adult in Saint Vincent and the Grenadines will have access to basic risk and vulnerability information for their community (including base maps, localised vulnerability information, and trained local leaders). Curriculum development for primary and secondary schools can be drawn from regional and international examples and adapted for Saint Vincent and the Grenadines schools.

- **More Knowledgeable Decision-makers, Families and Children**

Knowledge and capacity in specific Ministries and Agencies will be developed and strengthened. This will be evidenced by a significant number of government, and businesspersons with skills, knowledge and understanding of climate concerns and how climate affects the physical, social and economic environments of Saint Vincent and the Grenadines. Climate impacts on key economic sectors will be mainstreamed into legislative controls and guidelines developed for water conservation and waste-water management for households and small businesses. Geographic Information Systems (GIS), data collection and management skills and capacities, and general climate change knowledge and awareness will be evident in at least six Ministries/Agencies (Agriculture, Physical Planning, NEMO, Works, Lands and Statistics-MoFEP). The collection of climate information (knowledge, needs and awareness questions) will be included in the National Census.

- **Stakeholder Guidance Strengthened**

The consultation processes that has been developed over the course of Phase One, will continue throughout Phase Two. From the Technical Working Group members (some twenty-five Ministries and Agencies represented), an Advisory Panel will be formed to provide regular oversight and advice to the implementation of Phase Two. This Advisory Panel will be strengthened by the inclusion of additional businesspersons and citizen representatives from the three pilot areas. The SPCR thus, remains country driven and country led.

- **Legislation and Enforcement enhanced (mainstreaming)**

The newly improved legislation (both Acts of Parliament and Guidance documents prepared by Statutory Authorities) will be inclusive of climate change concerns, resilience building activities, and the individual Sectoral Plans that are based on the National Economic and Social Development Plan will include both guidance and incentive measures for voluntary adherence and compliance to recommended climate-related actions. Relevant Strategic Objectives (4.2 to 4.5) of the NESDP will be followed, implemented, and enforced to a new level of compliance. Subsequent Sectoral Plans will be climate and gender sensitive.

Legislation is strengthened and is climate sensitive. A wide range of policies and plans are finalized (in consultation with key Ministries and agencies) and ready for implementation. These include the Coastal Zone Management Policy and Plan, the Climate Change Adaptation Strategy, the Disaster Management Plan, the Integrated Water Resources Management Plan and the National Economic and Social Development Plan. These plans and policies once finalized would be ready for submission for the approval of Cabinet. Once approved, climate change resilience would formally be mainstreamed into the framework of government. Where appropriate, gender sensitivities should also be added where it is currently missing.

- **Safer Coastal Areas**

With a concerted effort aimed at the households and businesses in the Red Zone (less than five meters or sixteen feet above sea level), gradually, people in these areas will become more "climate-aware" and Government will resist construction of infrastructure in these areas, offering incentives to businesses to also take action to minimise potential loss from adverse climate and weather related impacts. Disaster preparedness will be significantly improved by the provision and participation in the development of early warning systems for communities. Effective water conservation techniques will reduce potable water vulnerabilities in the Grenadines.

- **Water resources conservation and management of watersheds**

An integrated watershed management policy and action plan will be formulated, implemented and enforced especially to address increased storage capacity, pollution control of water resources, increase collection/harvesting of rainwater and surface waters, providing incentives for increasing household and commercial/private businesses storage capacities and the installation of water conservation devices, and a public policy and drive to equip all public/government buildings especially health, sport and education facilities with water conservation devices. A new water consciousness in Saint Vincent will see the development of rainwater harvesting (currently almost nil) and adherence to new building code regulations relating to water conservation, drainage and wastewater.

The implementation of a land use zoning and watershed management plan will promote and reflect best practices and include the reduction of impermeable surfaces will allow for more water to infiltrate and percolate into the soil thus increasing ground water storage and replenishment of rivers and wells. A comprehensive public education, awareness and outreach program on water conservation and management, that promotes the installation of water conservation devices and provision of incentives/disincentives, will increase knowledge, change attitudes and practices of the citizens thereby reducing individual and community vulnerabilities.

8. Expected Key results from the Implementation of the Investment Strategy (consistent with PPCR Results Framework):	
Result	Success Indicator(s)
<p>1. Strengthened Community Resilience <i>More confident coastal and inland communities better able to cope with the impacts of changing weather systems.</i></p>	<p><i>Increased ability of coastal communities to cope with climate hazards including extreme weather (incl. better prepared, provided with early warning, increased capability to recover).</i></p> <p>Measures: <i>Census data questions on vulnerability and resilience, decrease in economic and social losses post-disaster events, decreased loss of roads and bridges, damage to river banks, decreased loss of livelihoods, lower levels of overall community impacts from climate hazards, improved ability to cope with disaster events (social survey).</i></p>
<p>2. Increased Socio-economic stability <i>Vulnerable communities more knowledgeable of climate resilience, diversified livelihoods and livelihood protection.</i></p>	<p><i>Communities incur fewer losses, businesses are better prepared, visitors are better informed (marine and land-based tourists), environmental conservation is better managed by improved legislative frameworks, and enforcement achieves increased levels of success.</i></p> <p>Measures: <i>Damage and Loss Assessment indicates fewer losses in coastal areas, lower economic impacts (fewer loss of livelihoods), increased awareness of visitors (survey), improved environmental practices (water conservation, water recycling) on the Grenadines, improved water accessibility in the Grenadines, increased use of rainwater harvesting and storage in the island of Saint Vincent.</i></p>
<p>3. Increased capacity in Government institutions <i>Climate change expertise is available to all ministries, regular information sharing amongst Government departments and Regionally on climate issues.</i></p>	<p><i>Climate resilience becomes a national concern; motto adopted that "climate change is everybody's business"; regional climate change events hosted by Saint Vincent and the Grenadines, Government (Ministries/Agencies) at all levels have a strategy for building climate resilience in their sector.</i></p> <p>Measures: <i>Six Ministries/Agencies (Agriculture, Physical Planning, NEMO, Works, Lands and Statistics-MoFEP) have equipped and skilled persons for data management and GIS mapping. Eight Ministries/Agencies have had personnel trained in climate change impacts assessment (sector-specific), increased attendance in Regional climate discussions and activities, Climate change expertise available in Ministry of Finance, Ministry of Health and Environment, publications on Governance available to Government officials (all Ministries).</i></p>

<p>4. Strengthened knowledge and awareness</p> <p>Information on climate change is available to every citizen in Saint Vincent and the Grenadines, and basic training delivered to every constituency and to a strengthened community leadership.</p>	<p>The implementation of a National programme of public education and curriculum development in schools results in increased awareness of climate change and resilience that is exemplary in the Caribbean Region.</p> <p>Measures: Curriculum active in all schools, teachers trained to deliver climate change and disaster reduction education, climate change information and materials available to schools and teachers, number of community leaders trained in Hurricane Preparedness, number of brochures and publications available to the general public on climate change impacts at community level, early warning system (EWS) installed, number of communities trained in EWS leadership. Responses to climate questions in the Census.</p>
<p>5. Comprehensive hazard maps available to Government and communities</p> <p>GIS mapping of social, economic and environmental impacts of climate change is upscaled to a National level, with hazard and vulnerability maps available to all vulnerable communities and community leaders.</p>	<p>A range of hazard maps prepared, including Red Zone maps, and made available to affected and vulnerable communities. Increased capacity of Government in the use of GIS as a policy and education tool is measureable. NEMO is able to generate a range of Hazard and Vulnerability Maps, with in-house expertise also available to MoFEP, MoHE and Physical Planning Unit.</p> <p>Measures: Number of constituencies with localised Hazard and Vulnerability maps; number of competent GIS practitioners available to Government departments; amount of data made available for inter-agency use and sharing; number of presentation made by NEMO to agencies, communities on climate change and mapping hazards and vulnerabilities.</p>
<p>6. Gender sensitive disaster risk management designed and implemented</p> <p>Considerations of gender and age must be disaggregated to understand that vulnerable communities and individuals suffer disproportionately higher losses, injuries and damages from both natural and anthropogenic hazards.</p>	<p>Shelter Management plans include special considerations for privacy, health and personal needs of women and the elderly; gender-specific publications provide guidance to women and men on disaster preparedness, tools to adapt to a changing climate, and basic gender-specific guidelines for response to climate impacts and tools for a speedy recovery.</p> <p>Measures: Gender-sensitive Shelter Management Policy is operational, implemented and a number of shelters refurbished; publications on gender-specific concerns for preparedness ad response to the impacts of climate hazards; gender issues incorporated into guidelines and legislation.</p>
<p>7. Collaboration, cooperation and support</p> <p>Building climate resilience is everybody's business. Communities need to assume control of their collective needs in partnership with Government and businesses. A Team effort is necessary for effective disaster preparedness, response and recovery.</p>	<p>Government actively develops a spirit of collaboration, cooperation and support, citizens recognise the Government is committed to climate change and a green, clean Saint Vincent and the Grenadines; Saint Vincent and the Grenadines becomes a model country in the Caribbean with the development of the three Pilot areas demonstrating all aspects of building resilience for families and communities.</p> <p>Measures: Ministerial support measured by appointment of climate change focal point; number of businesses contributing to publications; number of hotels cooperating on Legislative change for coastal areas; number of communities and constituencies requesting support for building climate resilience; number of appearances in the media of climate issues.</p>

9. Project and Program Concepts under the SPCR: (figures rounded)							
Project/Program Concept Title	MDB	Requested PPCR Amount (\$)¹	Grant or Loan	Expected co-financing (\$)	Preparation grant request (\$)	Total PPCR request	MDB Fee
Component 1: <i>Climate Vulnerability, Risk Assessments and Risk Reduction</i>	WB	\$6,130,500	Grant	TBD	US\$155,000	US\$6,285,500	
Component 2: <i>Data Collection, Analysis and Information Management</i>	WB	\$1,097,000	Concessional Financing	TBD	US\$15,000	US\$1,112,000	
Component 3: <i>Strengthening of Existing Policy, Legal and Institutional Framework to Address Climate Change</i>	WB	\$1,340,000	Concessional Financing	TBD	US\$38,000	US\$1,378,000	
Component 4: <i>Design and Implementation of a Public Education and Capacity Building Programme</i>	WB	\$805,000	Grant	TBD	US\$48,000	US\$853,000	
Project Preparation <i>Design specification and equipment procurement</i>	WB				US\$787,000	US\$787,000	
Project Preparation <i>Administrative support and Project Management (for details see Part Three: Project Preparation Funding)</i>	WB				US\$178,000	US\$178,000	
<i>For MDB Fee see SCF Financing benchmarks</i>							US\$428,000 (not included in Total)
TOTAL		\$9,372,500		TBD	US\$1,220,000	US\$10,592,500	

¹ Includes preparation grant and project/program amount.

10. **Timeframe** (tentative) – Approval² Milestones

For all Project Components:

Phase 2. Proposal completed by February 2011; World Bank Board Presentation May 2011; CIF Submission March 2011; Expected Date of Signature of Loan/Grant Agreement between country government and MDB signed Summer (most likely September 2011; First SPCR Investment disbursement: 4th Q 2011 (continuity with Phase 1).

Component 1: Climate Vulnerability, Risk Assessments and Risk Reduction

Project preparation expected to start in April 2011; Grant agreement for project preparation (incl. feasibility study) in April 2011; Feasibility Study disbursement: 2nd Q 2011; Full Project Documentation (Investment Board Approval) 3rd Q 2011 (continuity with Phase 1).

Component 2: Data Collection, Analysis and Information Management

Project preparation expected to start in April 2011; Grant agreement for project preparation (incl. feasibility study) in April 2011; Feasibility Study disbursement: 2nd Q 2011; Full Project Documentation (Investment Board Approval) 3rd Q 2011 (continuity with Phase 1).

Component 3: Strengthening of Existing Policy, Legal and Institutional Framework to Address Climate Change

Project preparation expected to start in April 2011; Grant agreement for project preparation (incl. feasibility study) in April 2011; Feasibility Study disbursement: 2nd Q 2011; Full Project Documentation (Investment Board Approval) 3rd Q 2011 (continuity with Phase 1).

Component 4: Design and Implementation of a Public Education and Capacity Building Programme

Project preparation expected to start in April 2011; Grant agreement for project preparation (incl. feasibility study) in April 2011; Feasibility Study disbursement: 2nd Q 2011; Full Project Documentation (Investment Board Approval) 3rd Q 2011 (continuity with Phase 1).

11. **Key national stakeholder Groups involved in SPCR design**³:

Ministry of Works
Bridges Roads and General Services Authority (BRGSA)
Ministry of Health and the Environment
Ministry of Agriculture Forestry and Fisheries
Ministry of National Mobilisation, Social Development Etc
Ministry of National Security
Saint Vincent and the Grenadines Port Authority
Saint Vincent and the Grenadines Coast Guard
Saint Vincent and the Grenadines Maritime Administration
Saint Vincent and the Grenadines Fire Services
National Parks, Rivers and Beaches Authority
Ministry of Housing, Physical Planning, Land and Informal Settlements
Attorney General's Office
Saint Vincent and the Grenadines Meteorological Office

Basic Needs Trust Fund (BNTF)
Central Water and Sewage Authority
Ministry of Finance and Economic Planning
Saint Vincent and the Grenadines' National Trust
Grenadines' Affairs
SANDWATCH
Saint Vincent and the Grenadines' Hotel and Tourism Authority
Private Climate Change Activists
Saint Vincent and the Grenadines' Chamber of Industry and Commerce
Social Investment Fund
Saint Vincent and the Grenadines Electricity Services Ltd
Energy Unit
National Emergency Management Organisation (NEMO)
Ministry of Tourism
International Airport Development Corporation (IADC)

12. **Other Partners involved in SPCR:** *Ministry of Health and Environment*

² Expected signature of loan/grant agreement between government and MDB.

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

Part 1: Background and Rationale

Introduction

The objective of the PPCR is to provide incentives for scaled-up action and to support transformational change through the integration of climate risk and resilience into core development planning and the design of projects to build resilience to climate change. It also creates a platform to complement other ongoing development activities in other pilot countries in the Caribbean, and the region.

The PPCR in Saint Vincent and the Grenadines is led by the Ministry of Finance, Central Planning Division, in collaboration with the Ministry of Health and Environment – Environment Management Department. Implementation in Phase Two will enable Saint Vincent and the Grenadines to comprehensively address climate risks and vulnerabilities and to reduce climate vulnerabilities in many sectors of the economy.

The comprehensive nature of the PPCR will ensure its value goes well beyond the immediate needs to request CIF support; it will be utilised to further assist with garnering bilateral and multilateral support to sustain efforts to build resilience, expand knowledge and awareness in the country and to provide a firm basis for transforming policy and National development planning to be risk-, climate- and gender sensitive.

Saint Vincent and the Grenadines, like many Small Island Developing States (SIDS), has many features that serve to increase its vulnerability to the potential impacts of Climate Change. These characteristics include:

- small size, the total land mass is 150 square miles (389 square kilometers);
- surrounded by large expanses of ocean;
- limited natural resources;
- rugged and steep topography, the islands are prone to landslides and sediment flow;
- vulnerability to natural disasters and extreme events;
- openness of the economy;
- poorly developed infrastructure;
- limited access to international financial resources; and
- limited human resources and skills.

Climate Change in Saint Vincent and the Grenadines

Saint Vincent and the Grenadines is a coastal island community of a little over 100, 000 persons. Connections to the sea are, and have always been a central element in the culture and history of Vincentians. Living on or near the coast is both a choice and a necessity; i) for mountainous and steep inland areas on Saint Vincent, and ii) for the beauty and natural resource amenity of coastal beaches for those in the Grenadines (the majority). The projected increase in severity of tropical storms and the concurrent wave surge provides one of the most significant threats to coastal communities. It is however the potential combination of storm surge, sea level rise and tidal fluctuations that cumulatively provides us with a benchmark for planning (priority) and a focus area for much of the SPCR implementation. This was the rationale behind the creation of the “Red Zones” described below.

The impacts of climate change do not occur in isolation. The concurrent impacts on different social, economic, and environmental systems will combine in ways that are outside of our collective experiences. For example, even if precipitation is higher in certain areas, the increased temperature

could result in much higher evaporation and transpiration, leading to reduced runoff into streams and rivers and increased water stress⁴. Building resilience means preparing for such uncertainties.

Saint Vincent and the Grenadines is embarking on a proactive approach to reducing climate risk; i.e. strengthening the country and its people to be able to cope with our changing climate and to minimize potential damage and losses from the impacts of climate hazards – or in short, building resilience.

We know from the International Panel on Climate Change⁵ that climate change will have several negative effects around the globe, including greater frequency of heat waves; increased intensity of storms, floods and droughts; rising sea levels; a more rapid spread of disease; and loss of biodiversity. Sea level rise (SLR) poses a particular threat to countries like Saint Vincent and the Grenadines with heavy concentrations of population and economic activity in coastal regions⁶. Sea level rise (SLR) due to climate change is a serious threat: Continued growth of greenhouse gas emissions and associated global warming could well promote SLR of 0.5m – 1.0m in this century, and unexpectedly rapid breakup of the Greenland and West Antarctic ice sheets could easily produce a 5m SLR⁷. To date, there is little evidence that any country has seriously considered the implications of SLR for population location and infrastructure planning. This is what the PPCR is for, and we can confirm that this is an urgent need in Saint Vincent and the Grenadines.

The Red Zone

For precautionary planning purposes, sea level rise (SLR) in the range of 0.5m – 1.0m should therefore be regarded as realistic (this century). For our risk assessments in the SPCR, we have taken a 1.0 meter maximum SLR, added three (3) meters for the projected maximum storm surge (this was confirmed in the 2007 Coastal Vulnerability Assessment for Saint Vincent and the Grenadines), and one meter of contingency (20%), giving us a five (5) meter contour line that defines the most vulnerable coastal zone. This is a conservative red zone, assuming a 3m maximum storm surge will not be exceeded (it has not been exceeded in the past). The Red Zone then has provided a focus for the analyses of the social, economic and environmental impacts of possible inundation to this five (5) meter contour height above sea level. The designation and delineation of this Red Zone is used as a planning tool throughout the Phase Two implementation, giving special emphasis to the vulnerable families and communities living and working in this vulnerable coastal area. Further support for the use of this tool can be found in the rationale described in a number of the coastal zone actions in the Investment Programme. Figure 1. provides the total number of assets located in red zones of the island of St. Vincent.

Figure 1: Critical Assets Exposed to Natural hazards in Saint Vincent

Facilities	Red Zones
No. of Schools	9
No. of Shelters	12
No. of Medical Facilities	4
No. of Building	2970
Total Length of Roads (km)	43.1

⁴ *Adapting to Climate Change*, East Asia Environment Monitor, World Bank, 2007, p. 27.

⁵ IPCC, 2001b: Synthesis Report 2001- Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, R.T. Watson (ed.) and the Core Writing Team. Cambridge: Cambridge University Press, 397 pp.

⁶ *The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis*, World Bank Policy Research Working Paper 4136, February 2007, p2.

⁷ *Ibid*, p.3.

Figure 2: Social and economic statistics for Saint Vincent and the Grenadine**Social indicators**

Population growth rate (avg. annual %)	2005-2010	0.1
Urban population growth rate (avg. annual %)	2005-2010	1.3
Rural population growth rate (avg. annual %)	2005-2010	-0.2
Urban population (%)	2007	46.6
Population aged 0-14 years (%)	2009	26.9
Population aged 60+ years (women and men, % of total)	2009	10.2/8.7
Sex ratio (men per 100 women)	2009	101.9
Life expectancy at birth (women and men, years)	2005-2010	73.8/69.5
Infant mortality rate (per 1 000 live births)	2005-2010	23.3
Fertility rate, total (live births per woman)	2005-2010	2.1

Summary statistics

Region	2000	Caribbean
Currency	2008	E.C. Dollar (XCD)
Surface area (square kilometers)	2008	389
Population in 2008 (estimated, 000)	2008	109
Population density in 2008 (per square kilometer)	2008	280.3
Largest urban agglomeration in 2007 (population, 000)	2007	Kingstown (26)
United Nations membership date	2000	16-Sep-80

Economic indicators

GDP: Gross domestic product (million current US\$)	2008	602
GDP: Gross domestic product (million current US\$)	2005	438
GDP: Gross domestic product (million current US\$)	2000	335
GDP: Growth rate at constant 1990 prices (annual %)	2008	5
GDP: Growth rate at constant 1990 prices (annual %)	2005	1.9
GDP: Growth rate at constant 1990 prices (annual %)	2000	1.8
GDP per capita (current US\$)	2008	5514.7
GDP per capita (current US\$)	2005	3674.6
GDP per capita (current US\$)	2000	2890.8

Source: UNData: World Statistics Pocketbook | United Nations Statistics Division

Accessed: 24 February 2011

<http://data.un.org/CountryProfile.aspx?crName=Saint%20Vincent%20and%20the%20Grenadines>

1. Country Circumstances

1.1 Location and Size

Saint Vincent and the Grenadines (SVG) is an archipelagic state, consisting of approximately 32 island and Cays, located at latitude 13° 15' N, longitude 61° 12' W. Saint Vincent and the Grenadines located 120 km (75 miles) to the north of Grenada, 40 km (24 miles) to the south of Saint Lucia and 160 km (100 miles) to the west of Barbados.

Saint Vincent and the Grenadines covers a total land area of approximately 390 km² (150 sq. miles). Saint Vincent is the largest island and covers an area of 344 km², which approximately 84 km of coastline. The Grenadines include the islands of Bequia, Mustique, Canouan, Mayreau, Union Island, Palm Island, and Petit Saint Vincent and extend 72 km (45 miles) to the southwest of Saint Vincent.

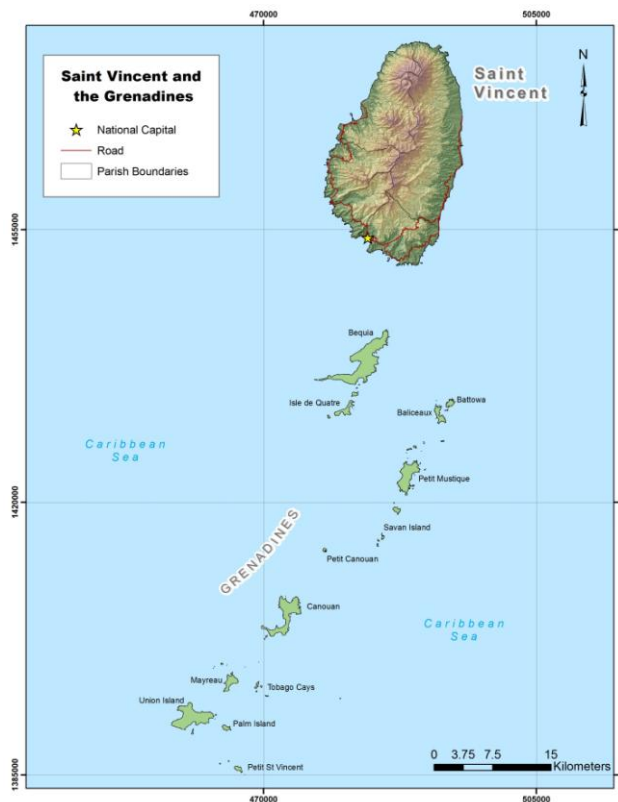


Figure 3: Map of Saint Vincent and the Grenadines

1.2 Topography

Saint Vincent is roughly oval in shape. It has a central spine of volcanic mountains that stretch from north to south along the entire length of the island with steep lateral ridges radiating towards the east and west. These steep lateral ridges result in almost vertical cliffs and deep narrow stream filled valleys that drain unto black sand beaches on the Leeward coast while the Windward coast has wider, flatter valleys and truncated spurs which are lower and more rounded than those of the leeward coast.

The highest point on this mountain range is the La Soufriere volcano to the north that rises to approximately 1,246 meters (4,048 feet) above mean sea level. Other mountain peaks south of La

Soufriere include the Richmond Peak, Mount Brisbane, Grand Bonhomme, Petite Bonhomme and Mount Saint Andrew.

The main island of Saint Vincent is very rugged with 50% of the slopes 30 degrees or more and 20% less than 20 degrees (Barker, 1981 cited in Caribbean Conservation Association (CCA), 1991). The topography and population dynamics of the islands result in most towns and villages being established on the flat coastal regions and are thus very vulnerable to sea level rise as a result of climate change.

The Grenadines are geologically older than Saint Vincent and have a much gentler relief with no point higher than 1000 feet. The Grenadines are surrounded by fringing reefs and white sandy beaches.

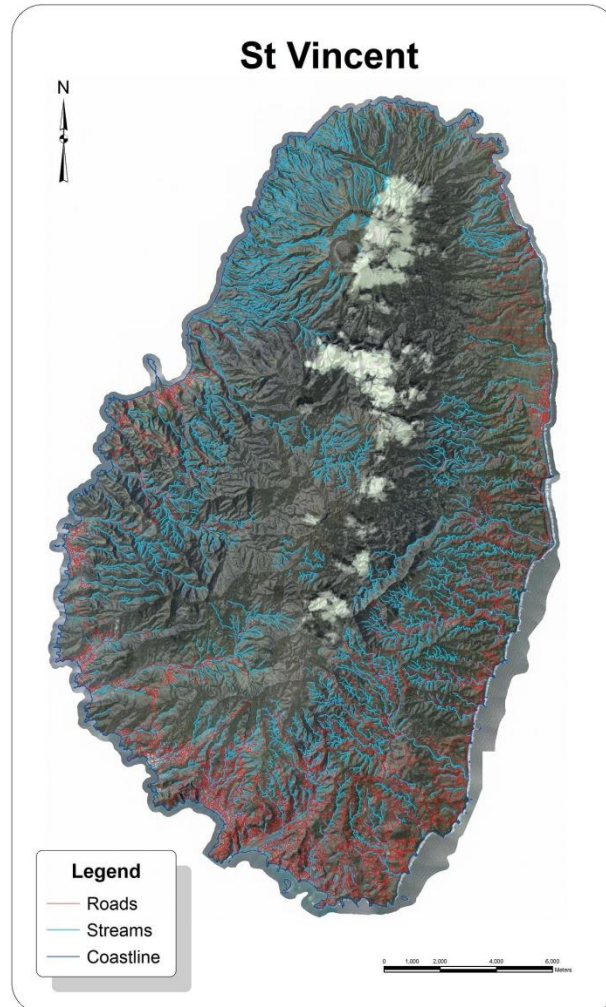


Figure 4: Topography of Saint Vincent

1.3 Climate

Precipitation: On average Saint Vincent and the Grenadines receives 219 cm of rainfall per year. The wet season occurs during June to November and the dry season between January and May. Saint Vincent receives approximately 70% of its total annual rainfall during the rainy season, which is also the period of highest tropical storm activity in the region, which peaks in the months of September, October and November.

Additionally, a number of weather systems affect Saint Vincent and the Grenadines annually. These include tropical Atlantic High Pressure System that brings most of the rain, the Inter-Tropical

Conversion Zone (I.T.C.Z) and the El Nino Southern Oscillation. During the drier months, upper level troughs and the remnants of the cold fronts from the eastern sea border of the United States contribute to the rainfall in Saint Vincent. The island enjoys the cooling effect of the north east trade winds which can be quite gusty at times.

Most models project a drying throughout the year in Saint Vincent and the Grenadines. Maximum possible changes indicate up to 24% less annual rainfall by the 2030's, 41% less rainfall by the 2060's and 58% less rainfall by the 2090's. The models also point to drying occurring in the wet season from June to November.

Temperature: Saint Vincent has a tropical, oceanic climate with an annual mean temperature of 27°C while the mean temperature vary by 2°C throughout the year. Maximum temperature can reach a high of 31°C between the months of May and October and minimum temperatures can reach a low of 23°C in February. Both the maximum and minimum temperature records show a warming trend over the past 22 years. The maximum temperature for Saint Vincent and the Grenadines is increasing at a slightly faster rate (0.2°C/decade) than minimum temperatures (0.15°C/decade).

Temperature indices support the conclusion that warm days and nights have increased over the last two decades and cool days and nights have decreased.

Global Climate Models (GCMs) project that for Saint Vincent and the Grenadines mean temperatures are expected to increase over the next century, on average approximately 0.15°C per decade. Under A2 (high emissions) GCM project maximum temperature changes of up to 4°C by the end of the century, with median annual increase of up to 1°C, by the 2030s, and 1.8°C by the 2060s and 2.7°C by the 2090s.

1.4 Sea Level Rise

As a result of global warming, the penetration of heat into the ocean leads to the thermal expansion of the water; this effect, coupled with the melting of glaciers and ice sheets, results in a rise in sea level. Sea-level rise will not be uniform globally but will vary with factors such as bathymetry (underwater profile, depth, shape) currents, winds, and tides-as well as with different rates of warming, the efficiency of ocean circulation, and regional and local atmospheric (e.g., tectonic and pressure) effects.

While it is not possible to project sea level rise for Saint Vincent and the Grenadines, changes in the Caribbean are expected to be near the global mean. Under the A1B scenario, sea level rise within the Caribbean is expected to be between 0.17 m and 0.24 m by 2050 (IPCC 2007).

Sea level rise is expected to lead to greater coastal flooding and damage to shorelines and infrastructure from storm surge. Additionally, deep surface swells from the Atlantic (often called Ground Swells) occasionally cause severe coastal erosion and infrastructural damage particularly on the northeastern side of Saint Vincent. The impacts from a combination of SLR and 1 in 100 year Storm Surge in the CARICOM nations include⁸:

- Over fifty percent of major tourism resorts at risk to damage in Saint Vincent and Grenadines, and
- Potentially severe flooding risk at the Saint Vincent and the Grenadines airport.

⁸ Simpson, M.C., et al, P.1 (2010) *Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modeling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean* (Key Points and Summary for Policy Makers Document), United Nations Development Programme (UNDP), Barbados, West Indies.

1.5 Climate extremes

Calculated rainfall indices show an increase in the number of heavy rainfall events that occur in a year. This is reflected in an increase in the number of days with rainfall between (10-20 mm) and the number of consecutive wet days. This trend is also reflected in the increase in some rainfall intensity indices e.g. daily intensity, maximum consecutive five-day rainfall and maximum one-day rainfall.

In general, north Atlantic hurricane frequency is characterised by a multi-decadal cycle that yields active and inactive phases lasting 10 or more years (Goldenberg et al. 2001). It is noteworthy that since 1995, the north Atlantic has swung into an active hurricane phase. Between 1995 and 2000 the region experienced the highest level of north Atlantic hurricane activity on record. Over the last three decades, the Caribbean region has suffered direct and indirect losses estimated at between US\$700 million and US \$ 3.3 billion owing to natural disasters associated with extreme weather events.

Further, Saint Vincent and the Grenadines over the years has received tremendous damages from storms. For instance, in 2002, Tropical Storm Lili caused damage estimated at EC\$978,000 (US\$366,000). Damages from Hurricane Ivan in 2004 amounted to EC\$100 million (US\$37.5 million). In 2005, Hurricane Emily caused an estimated EC\$10 million dollars ((US\$3.75 million) worth of damages, while Hurricane Dean caused EC \$2.2 million (US\$0.82 million) worth of damages in 2007. In 2008, Hurricane Omar inflicted damages of an estimated EC\$5.6 million (US\$2.1 million). Models indicate that hurricanes in the future will likely become more intense, with larger peak wind speeds and heavier near storm precipitation.

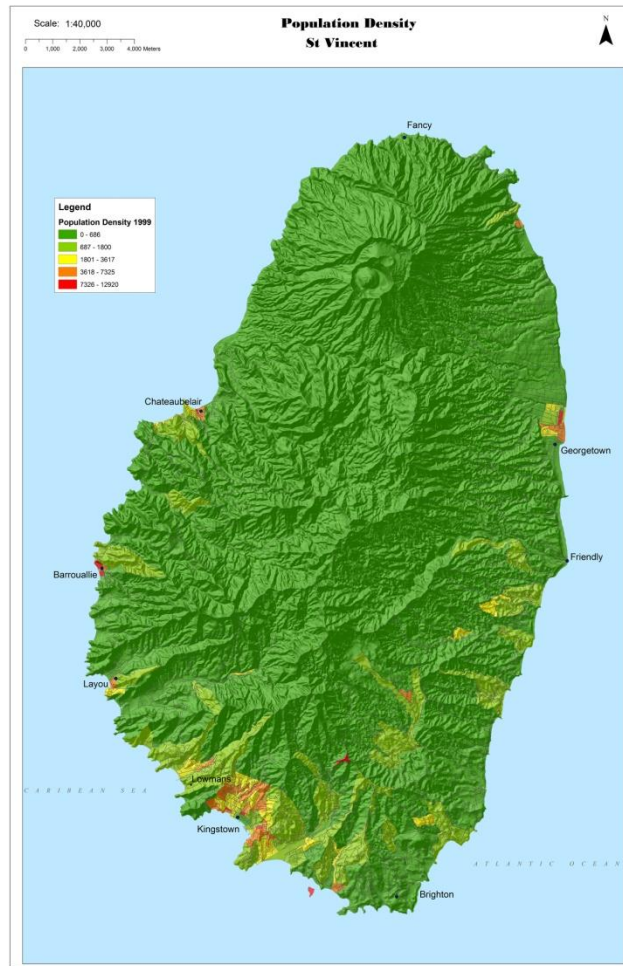
1.6 Population and Demographics

The population of Saint Vincent and the Grenadines as derived from the 2001 Population and Housing Census was 106,253 inhabitants with 25% of the people living in the capital, Kingstown and its suburbs and 8% on the Grenadines. The mainland population from the census count broken down into thirteen administrative census districts shows Calliaqua has the largest population of 22,095 while the smallest population, 2,716 is found Sandy Bay.

Kingstown, the capital, had a population of 13,212 at the time of the census. The census data also indicated that the Suburbs of Kingstown had a 50% population between 1980 and 2000. The latest estimate of the population for Saint Vincent and the Grenadines is 100,237 for the year 2007. The population is young, with 19,819 between the ages of 15-24. The average life expectancy is 67.7 years for males and 74.0 years for females. Since 1960, the infant mortality rate has fallen substantially, from 145.0 to 12.1 per thousand births in 2009. The population is projected to reach 121,399 by the year 2021, an increase of 14.3 % above the 2001 census figure.

Population Density After climbing steadily to reach 700 inhabitants per square mile in 1990, the population density for Saint Vincent and the Grenadines has stabilized at around 700 to 710 persons per square mile over the last decade. The Kingstown district remained the district of highest population density (3,660 per square mile) while the Chateaubelair remains the district with the lowest population density (6.4 per square mile).

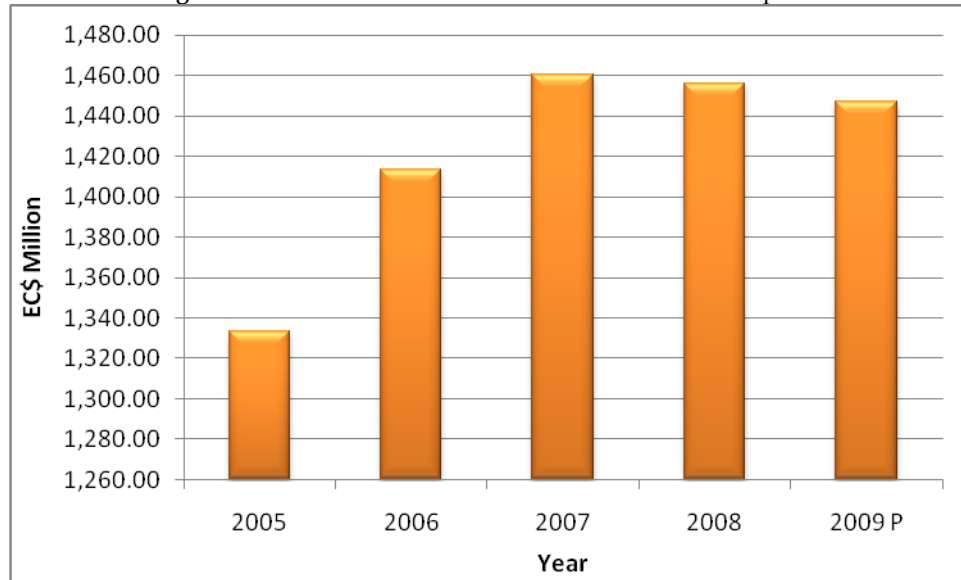
Figure 5: Population Density of Saint Vincent



The Economy Saint Vincent and the Grenadines is a small open economy, highly susceptible to both external economic shocks and natural disasters (European Community, 2002). The banana industry had been the main contributor to the economy with bananas being exported to Europe under preferential arrangements. Globalisation and changes in international trade regimes - trade liberalisation, erosion of market preferences and shares - have all had a disproportionate impact on the local economy.

Gross Domestic Product and Growth Rates During the period 2005 to 2007 the economy of Saint Vincent and the Grenadines experienced moderate to strong real growth, ranging from a low of 3.0 percent in 2005 to a high of 6.0 percent in 2006. Overall the economy grew by an average of 2.3 percent annum during the 2005-2009 period.

Figure 6: Total Gross Domestic Product in Constant 2006 prices



Source: Government Statistical Department

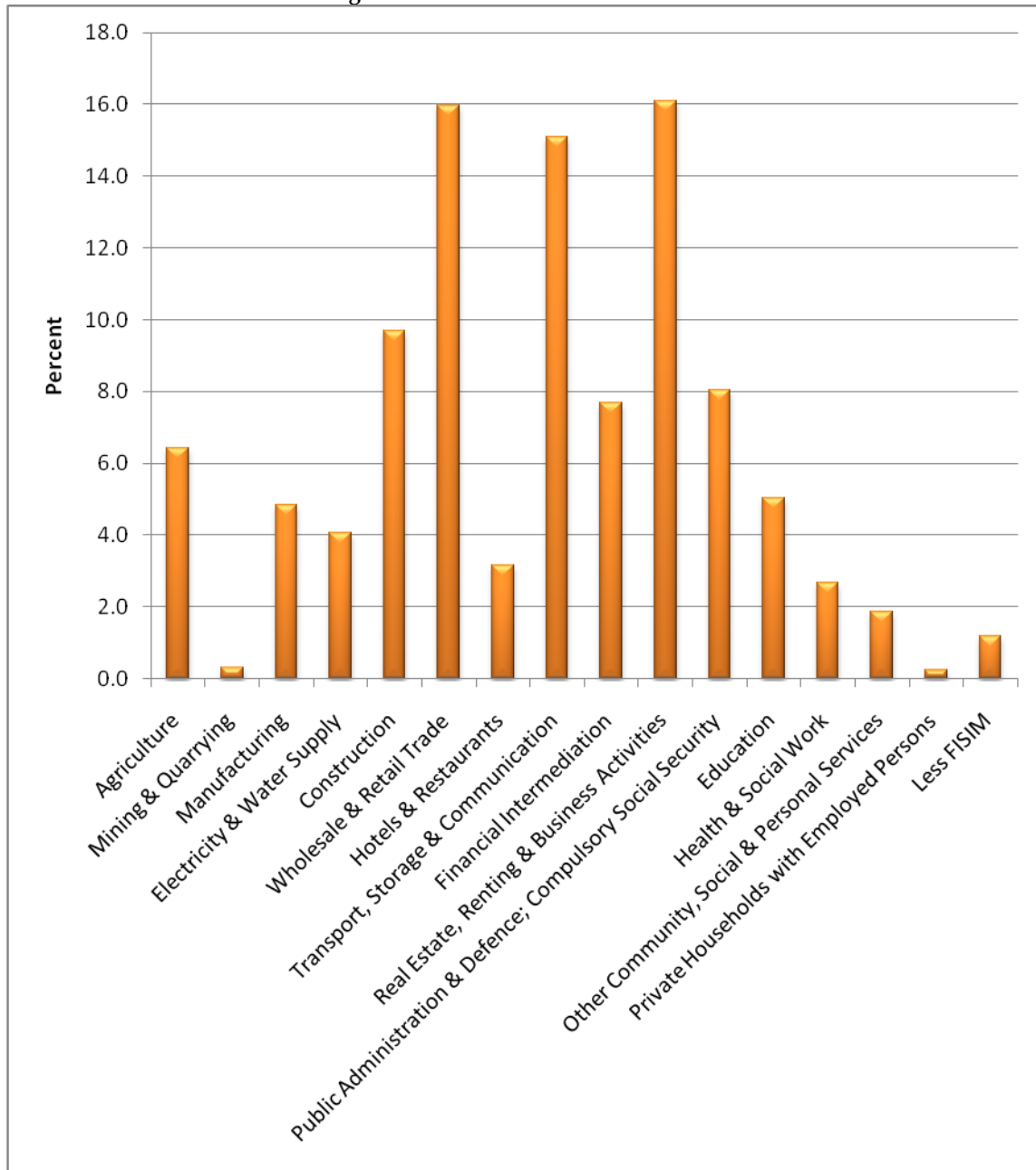
The graph above depicts Total Gross Domestic Product in Constant Prices for the period 2005 – 2009. The total GDP increased steadily from E.C\$ 1,333.37M to E.C\$ 1,460.13M in 2007. There was a 0.3 percent decline to E.C\$ 1,455.90M in 2008, followed by a 0.6 percent decline to EC\$1447.13M based on the preliminary estimates for 2009. Meanwhile, Retail Renting & Business Activities (16.1 percent), Wholesale and Retail Trade (16.0) and Transport, Storage and Communication (15.1 percent) were the largest contributors to GDP during the 2005-2009 period (See figure 8). Also, per Capita GDP increased by an average annual rate of 6 percent during the aforementioned period from EC\$ 14,183.75 (US\$5253.24) to EC\$18,709.61 (US\$ 6,929.49) in 2009 (See figure 9). This was amidst steady economic performances and a decline in the estimated population.

Figure 7: Sector's Contribution to GDP.

ECONOMIC ACTIVITY	2005	2006	2007	2008	2009 P
Agriculture	83.97	86.92	96.44	92.26	98.16
Crops	62.34	62.79	69.56	66.62	69.78
Bananas	16.11	12.98	13.99	12.61	13.77
Other Crops	46.23	49.81	55.57	54.01	56.01
Livestock	14.36	16.84	17.96	19.94	20.04
Forestry	0.9	0.91	0.93	0.91	0.89
Fishing	6.37	6.38	7.99	4.78	7.45
Mining & Quarrying	3.98	4.18	4.76	5	4.6
Manufacturing	71.01	71.01	67.82	67.54	66.62
Electricity & Water Supply	55.49	56.78	59.03	58.1	58.37
Electricity	40.82	41.38	43.71	42.7	41.57
Water	14.67	15.4	15.31	15.39	16.8
Construction	127.09	137.99	155.9	139.73	128.72
Wholesale & Retail Trade	205.37	215.42	235.05	244.21	235.95
Hotels & Restaurants	39.56	49.45	49.33	46.44	39.24
Accommodation	28.01	36.7	37.7	35.08	27.5
Restaurants	11.55	12.75	11.63	11.53	11.74
Transport, Storage & Communication	197.57	218	217.12	220.42	220.91
Road Transport	94.56	100.37	106	109.67	111.68
Sea Transport	13.39	15.96	18	16.51	16.92
Air Transport	2.13	2.4	2.08	2.07	1.86
Auxiliary Transport Activities & Storage	23.87	27.09	26.97	26.56	24.51
Communications	63.62	72.19	64.07	65.61	65.94
Financial Intermediation	104.99	110.04	105.76	111.41	112.73
Banks	76.11	79.16	76.18	81.08	82.24
Insurance	26.55	28.1	26.63	27.3	27.4
Auxiliary Financial Intermediation	2.33	2.78	2.94	3.04	3.1
Real Estate, Renting & Business Activities	215.81	227.52	229.16	233.98	237.2
Owner Occupied Dwellings	157.5	159.54	161.82	163.86	165.71
Real Estate Activities	26.9	27.21	27.55	27.86	28.13
Renting of Machinery & Equipment	6.9	7.52	8.89	8.99	9.17
Computer & Related Services	4.57	6.75	6.12	8.49	8.66
Business Services	19.93	26.5	24.79	24.78	25.53
Public Administration & Defence; Compulsory Social Security	100.71	107.2	113.92	123.03	127.8
Education	80.31	78.18	76.06	60.58	61.11
Public	55.9	55.23	55.64	57.94	58.46
Private	24.4	22.95	20.42	2.64	2.65
Health & Social Work	36.26	36.68	38.49	38.68	40.08
Public	30.08	31.02	32.92	32.36	33.66
Private	6.18	5.66	5.56	6.32	6.42
Other Community, Social & Personal Services	22.61	26.1	24.87	29.42	30.28
Private Households with Employed Persons	3.28	3.35	3.06	3.35	3.45
Less FISIM	14.63	15.64	16.63	18.42	18.25
GVA in Basic Prices (EC\$ Millions)	1,333.37	1,413.19	1,460.13	1,455.90	1,447.13
Growth Rate (%)	2.99	5.99	3.32	-0.29	-0.6
GDP MARKET PRICES (EC\$Millions)	1,488.57	1,649.81	1,848.67	1,896.69	1,887.65

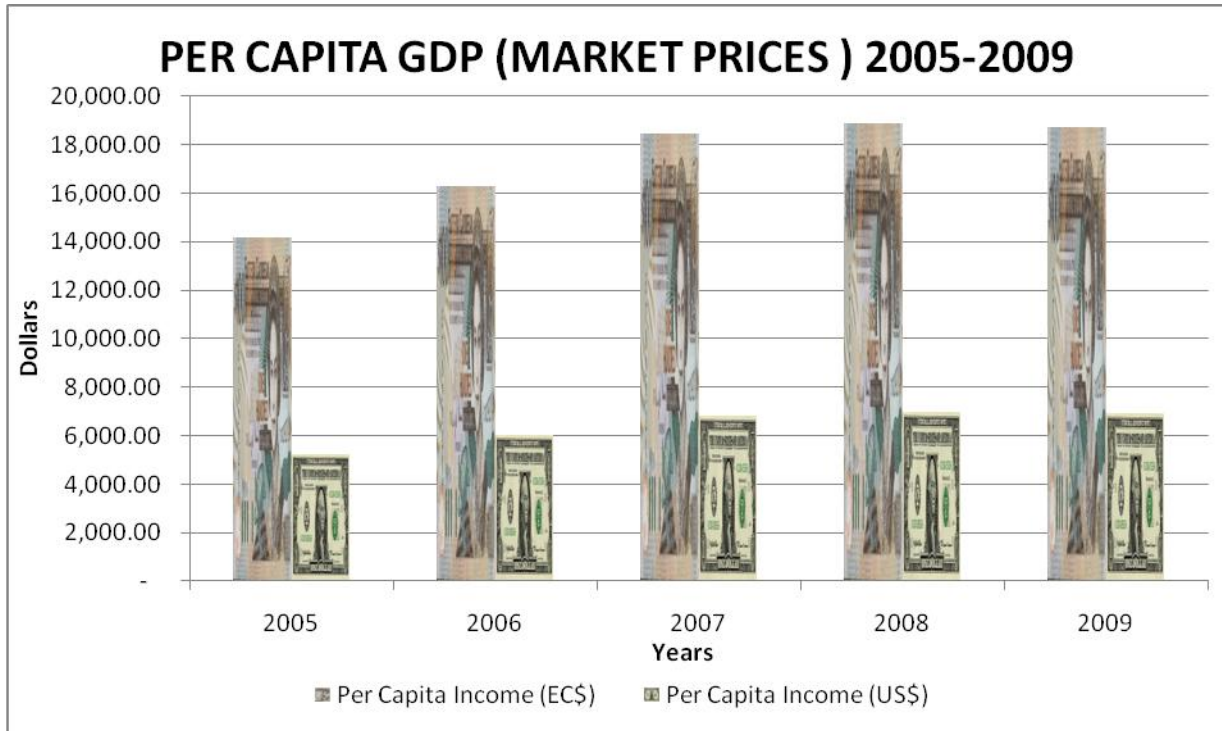
Source: Saint Vincent & the Grenadines Statistical Office / ECCB.

Figure 8: Contributors to GDP 2005-2009



Source: Saint Vincent & the Grenadines Statistical Office /ECCB.

Figure 9: Per Capita GDP 2005-2009

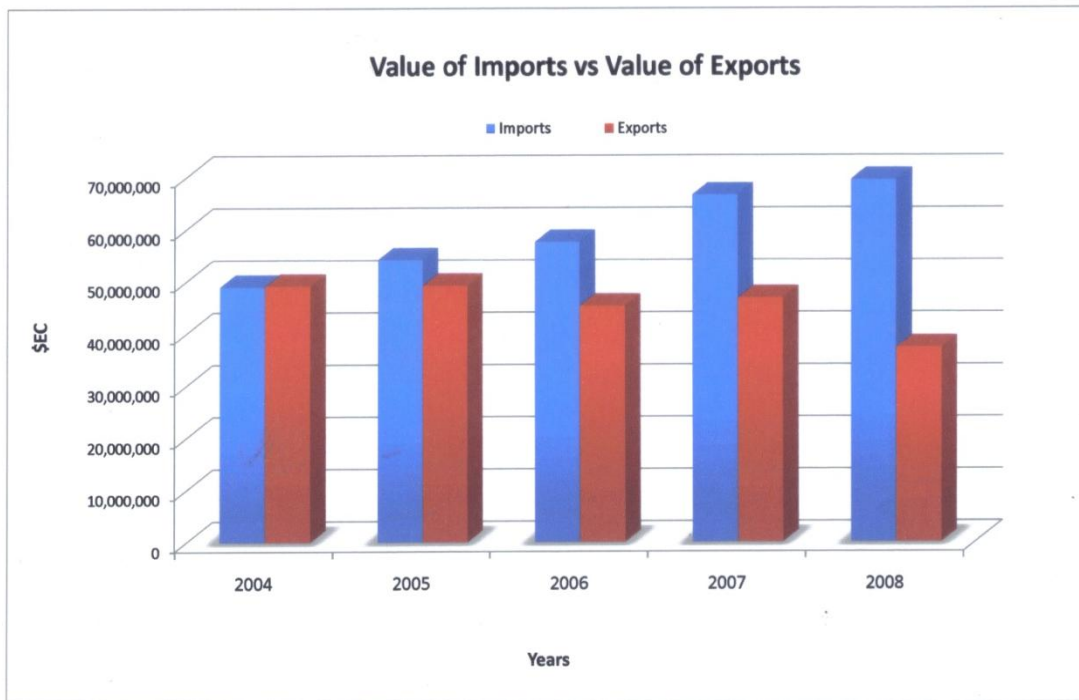


Source: Saint Vincent & the Grenadines Statistical Office /ECCB.

1.7 Agriculture

Agriculture in Saint Vincent and the Grenadines is largely practiced on the main island with some subsistence farming on the Grenadine islands. Throughout the eighteenth and nineteenth centuries, the economy of Saint Vincent was based largely on agriculture. During those periods, agricultural exports exceeded imports; however, this pattern has declined steadily since 2004. Bananas dominated the agricultural scene throughout the second half of the twentieth century until the loss of preferential trade in Europe and competition from the mega-producers in Central and South America caused its demise. This decline in the banana industry saw Saint Vincent move from being a net exporter of food crops to one of a net importer.

Figure 10: Value of Imports versus Export of Agricultural Products



Statistical Unit, Ministry of Agriculture, Forestry and Fisheries.

Agriculture and climate change: Given the geography, topography and current land use patterns in Saint Vincent, a climate change scenario that brings increased rainfall can devastate the agriculture sector through floods, landslides, accelerated loss of top soil, loss of crops and livestock, loss of agricultural infrastructure and even human lives. A scenario with decreased rainfall would be no less catastrophic, droughts will destroy the land, the animals and the vegetation cover.

Consequently, adapting to climate change or building resilience is therefore critical to the agricultural sector. The SPCR can assist by identifying and implementing adaptation options for the short medium and long-term survival of the sector.

1.8 Transport

Accessibility is seen as a major challenge to the development of Saint Vincent and the Grenadines. The transport system of the country is less than adequate to meet the current needs and demands of an expanding economy and society⁹. There are approximately 680 miles of vehicle road way and over 25,000 motor vehicles. As previously noted, the topography of Saint Vincent and the Grenadines has resulted in a large portion of the road network being located on the coastline, thus making it extremely vulnerable sea level rise and damage from passing storms and hurricanes.

There are five marine terminals in the country including the main deep-water port at Kingstown. The terminal in Kingstown consist of a 900 feet long deep water pier, an 800 feet long cruise ship terminal, a 250 feet long schooner facility and a 250 feet pier that serves the ferries shuttling through the Grenadines. There is a container port at Campden Park with a storage capacity of 540 containers. There

⁹ Saint Vincent and the Grenadines National Physical Development Plan 2001-2021

are also a number of smaller ports and jetties scattered around Saint Vincent and the Grenadines. The major ports are located on the sheltered western or leeward side of the island.

The E.T. Joshua Airport is the main airport in Saint Vincent and the Grenadines. There are five other smaller airports on the Grenadine Islands of Bequia, Mustique, Canouan and Union. They are all vulnerable to the impacts of sea level rise as they are located on the coast and just a few meters above the high watermark.

Figure 11: Transportation System



1.9 Industry

Saint Vincent and the Grenadines does not have a major manufacturing industry. It includes activities relating to tourism, agriculture, housing, mining and manufacture. This industry is not projected to play a major role in the country's economy in the near future given the absence of minerals, the small population and market size and the high cost of energy. These factors along with the absence of an international airport have reduced the competitiveness of Saint Vincent and an investment destination. Despite these challenges, the Government has provided land for factory space, for lease or sale to private entrepreneurs, at the Campden Park Industrial Estate and the Diamond Industrial Estate.

Rice and wheat imported from Guyana and Canada respectively are milled and packaged at a small plant located on the Campden Park Estate while arrowroot rhizome are processed into starch at Bellevue, Mt. Bentick and Owia on the north eastern side of the island.

Saint Vincent is endowed with large quantities of volcanic deposits in the form of igneous rocks. A number of quarries are set up to extract (mine) these rocks for use in the construction industry. Another mining venture that supports local construction is the mining of beach sand. This practice renders the coast areas vulnerable to storm surge and exacerbates the damage which can be done to the environment and property located along the coast.

1.10 Energy

Electric power for Saint Vincent and the Grenadines is provided by the Saint Vincent Electrical Services Ltd (VINLEC), which operates diesel power stations on Saint Vincent, Bequia, Canouan, and Union Island and five hydro power stations on Saint Vincent located at Cumberland and South Rivers. Seventy five percent of the electrical energy generated in Saint Vincent and the Grenadines comes from fossil fuel. The other twenty five percent is renewable energy generated by hydro-electricity. All fossil fuels are imported meet the energy requirements of the nation.

Over the last five years, the electricity company, VINLEC, has reported reductions in its hydro-electricity supply during the dry season due to reduce stream flow. There has been, especially in 2009, longer periods of drought which as exacerbated the problem of reduced stream flow in Saint Vincent. This has prompted the upgrade of the diesel plants in order to meet demand. Government is currently reviewing its legislation governing energy to encourage private generation of renewable energy.

Installed generating capacity for Saint Vincent is 35KWH while peak demand is approximately 30 KWH. The main consumers of this electricity are the domestic sector (48.3%), commercial sector (41.1%), industry (8%) and street lighting (2.6%)¹⁰. Less than 0.1% of Vincentian homes use some form of renewable energy. Of the 100 kilotonnes of fossil fuel imported into the country in 2002, approximately 40% was delivered to the pump to service motor vehicle while the remainder went to service light aircrafts, small boats, the food industry (cooking) and the electricity company.

The main source of CO₂ emissions in Saint Vincent and the Grenadines occurs as a result of the use of fossil fuels in the energy sector. The largest amount of CO₂ emissions resulted from Gas/diesel oil used mainly in the energy industries sector (VINLEC) and Gasoline which is used in the transportation sector (vehicles). Studies conducted at La Soufriere suggest that there is good potential for geo-thermal exploitation but no serious work has been done in this regard.

1.11 Tourism

Saint Vincent and the Grenadines tourism industry is seen as the economic earner as a result of the downfall of the agricultural industry. The industry has proven to be a significant driver of economic activity, foreign exchange earner and employment creator. This sector contributed 2.23% to the country GDP in 2004¹¹. Estimated earnings rose from EC\$189.09 million (USmillion\$70.8) in 1997 to EC\$217.17 million (USmillion\$81.3) in 2001. Latest figures indicate EC\$259.3 million (USmillion\$97.1) in earnings for 2008.

Saint Vincent and the Grenadines is currently in the process of diversifying its tourism product to branch into in the eco and sport tourism as well as to improve the accommodation sector. This is seen as a gateway to investments opportunities that in turn will create a stronger infrastructure system, which would support the tourism sector.

The diversification process will pay particular attention to promoting Saint Vincent and the Grenadines as a scuba diving destination. The government plans "to position Saint Vincent and the Grenadines as a diverse, globally competitive, destination"¹² through effective planning, management and sustainable use of the cultural and natural resources of the country, while facilitating the preservation of the local heritage.

¹⁰ Source: VINLEC Report 2003.

¹¹ Saint Vincent and the Grenadines Ministry of Tourism and Culture, 2005.

¹² Saint Vincent and the Grenadines National Tourism Policy, 2003.

As a significant contributor to the Saint Vincent and the Grenadines economy¹³, the tourism sector is also the most vulnerable, particularly vulnerable to the adverse impacts of climate-related hazards. As an industry, its raw materials are natural resources. Visitors come largely because of these natural resources. Clearly, there is good reason to place a high priority to building resilience in this sector. In the Grenadines for example, 16 of the 33 main hotels claim to be “on the beach”¹⁴. On the beach would mean being located close to water level, or certainly within the five meter “red zone”¹⁵. The percentage of forty-five marine based facilities described in the Tourism Master Plan¹⁶ is even higher, nearly 100%.

Economically, a disaster event can cripple a community in the short term; in a tourism-based economy those impacts and losses are likely to last far into the future. When tourism services are deemed unsafe or significantly affected by a disaster, visitors will quickly find another location, in as little as a few days. The Bali bombings in 2002 devastated the industry on the Bali, Indonesia Island, losing almost half its annual income that year, and the event was in October. There are countless examples of where the slightest sense of a lack of safety or security can be disastrous to the industry.

We know the extent of coral bleaching possible with only less than a half degree Celsius rise in sea surface temperature during La Nina and El Nino ENSO events. Changing rainfall patterns, changing intensity of tropical storms, even small temperature rises will change ecosystems upon which tourism depends. The resulting loss of beach sand, eroded coastline in the inter-tidal zone, loss of sea-grasses that anchor plants and animals critical to a healthy ocean floor: these are all consequences of a changing climate that is occurring right now.

Human (anthropogenic) impacts are another major contributor to the decline in health of the coastal environments in Saint Vincent and the Grenadines, not least of which are the recreational boaters. The 43,000 yacht visitors in 2008 are expected to almost double in the next ten years¹⁷. The current lack of environmental controls on this industry (e.g. discharging all liquid waste overboard, lack of anchoring controls, standards of practise, licensing etc.) is simply unsustainable. The priority target markets for the next decade are in three categories; four of the six top priority markets are marine-based¹⁸.

For these and other reasons, it is critical that the tourism dependent communities in Saint Vincent and the Grenadines plan for minimising losses from the likely impacts of a changing climate. Specific recommended investments for many of these needs are addressed in the SPCR Investment Plan.

This will require at least the following:

i) **Knowledge and Awareness Building**

Knowing what climate change means for coastal communities, likely impacts short- and long-term, carrying capacities of the popular marine environments/anchorages, site management of land-based facilities;

¹³ Estimated at 17.4%, Ministry of Finance and Economic Planning economist, 28 January 2010.

¹⁴ *Ins & Outs of Saint Vincent and the Grenadines*, 2011 Anniversary Edition, SVG Hotel and Tourism Association, p. 140.

¹⁵ The “red zone” is an area of low-lying coastline that lies between mean high water mark and a five-meter contour line along the coastal strip. See Section 2.8 Vulnerable Coastal Areas.

¹⁶ *Saint Vincent and the Grenadines Tourism Master Plan 2010-2020*, Final Version October 2010, p.99.

¹⁷ *ibid*, p.138.

¹⁸ *ibid* p. 145.

ii) Contingency Planning

Developing preparedness strategies (safe storage of adequate fresh water, medical supplies, food, essential items), possible evacuation routes, means of transport, contingency plans for community needs, attention to the needs of women, children and the elderly, strengthening environmental standards for impact assessments of future developments;

iii) Water and Waste Management

Developing a range of options for low-cost rainwater harvesting, tax incentives for water efficient house construction, building code guidelines and legislative controls for water management (including waste water recycling, home gardening, water storage etc.), and the use of holding tanks on boats with the introduction of pump-out facilities and recycling plants, strengthening environmental standards for waste water and solid waste disposal for each of the Grenadines, including the prevention of discharge of untreated waste from residential resort developments and commercial and recreational boats.

iv) Protected Marine Environments

While progress has been made with the establishment of the Tobago Cays Marine Park, this is just a start. Protection of the marine environment must be a priority set of actions that are locally owned and implemented, with strong Government support. The Sustainable Grenadines Project¹⁹ is seeking World Heritage Site listing under the UNESCO World Heritage Convention. Amongst numerous conditions to be satisfied for such listing, a comprehensive Plan of Management must be in place and operational. Such a Plan of Management could provide a firm basis of long-term protection from climate change impacts in the fragile ecosystems of the Grenadines, and for coastal Saint Vincent.

1.12 Forestry and Watershed Management

The Forest Resource Conservation Act, 1992 make provision for the conservation, management and proper use of the forest and watersheds. Sections under this act requires that the Director subject to certain conditions and he may specify, delegate any of his functions to any authorize officer. One such requirement is the preparation of a National Forest Resource Conservation Plan. This NFRCP shall include among other things, an estimate of the amount, condition and status of the elements necessary for integrated water resources management.

The FRCA also speaks of; the declaration of Forest Reserves, protected areas within forest reserves, demarcation of forest boundaries, forest management plans etc. The Forestry department through the Director is responsible for the enforcement of the provisions of the Act. In keeping within the mandate of the Act came the fashioning of the mission of the Forestry Department, which is, to conserve, protect and develop the national forest resources for the optimum benefit of the entire Vincentian communities.

The organisational structure of the Department encapsulates a combination of specialized program areas and general forest management on a whole which when looked at holistically, intrinsically is the practice of upper watershed management. Within the Department structure a unit was set up specifically to look at watershed management. This watershed unit is headed by a forestry supervisor and an assistant who performs more of a coordinating function.

¹⁹ SusGreen: www.cavehill.uwi.edu/cremes/susgrenadines-index.html

Figure 12: The Watersheds of Saint Vincent

1.13 Biodiversity

In Saint Vincent, more than 1,150 species of flowering plants, 163 species of ferns, 4 species of amphibians, 16 species of reptiles, 111 species of birds, and 15 species of mammals have been identified. In terms of marine biodiversity, over 500 species have so far been identified. Among these are at least 450 species of fin-fish, 12 species of whales and dolphins, 4 species of turtles, 9 of gastropods, eleven seaweeds and thirty different coral species.

The principal ecosystems where these species live include, dry and humid tropical forests, wetlands and tidal flats, sandy and rocky beaches, coral reefs, sea grass beds, mangroves, offshore islets. The reefs, sea grass beds and mangrove systems are recognized as among the most productive in the world.

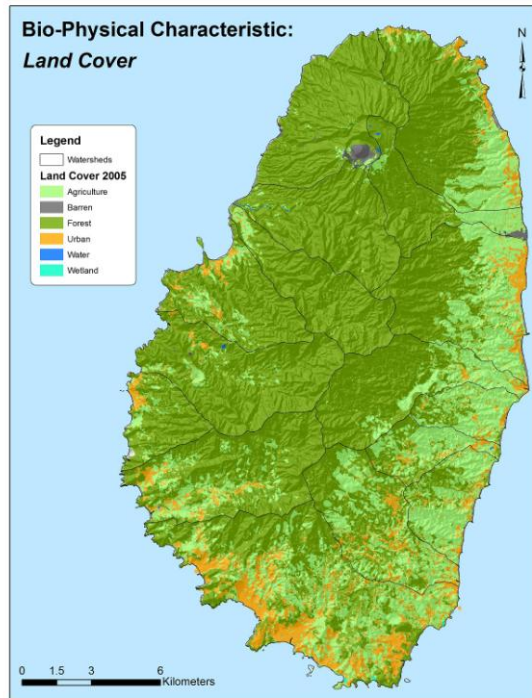
Consequently, climate change will affect the physical and biological characteristics of marine and coastal areas, modifying the structure and functioning of these fragile ecosystems. Their impairment will inevitably lead to losses in fisheries and coastal environment-dependent sectors such as tourism.

The vulnerability of the coastal zone must therefore be given particular attention given its importance to the Vincentian economy and the livelihoods of many persons in Saint Vincent and especially the Grenadines.

In Saint Vincent, more than 1,150 species of flowering plants, 163 species of ferns, 4 species of amphibians, 16 species of reptiles, 111 species of birds, and 15 species of mammals have been identified. In terms of marine biodiversity, over 500 species have so far been identified. Among these are at least 450 species of fin-fish, 12 species of whales and dolphins, 4 species of turtles, 9 of gastropods, 11 seaweeds and 30 different coral species. These species and the ecosystems which support them form the “natural infrastructure” upon which Vincentian society is built. The

establishment of nature reserves (terrestrial as well as marine) has therefore been identified as a viable option for arresting the decline in terrestrial, marine, and coastal biodiversity.

Figure 13: Land cover map of Saint Vincent



2. Development Context and Climate Risks

NOTE: A detailed description of climate risks, with diagrams and maps, has been moved to Annex 8. in the Resources Documents (ANNEXES) under separate cover. This Annex includes:

- Climate Risks in the Caribbean
- Climate Risks in Saint Vincent and the Grenadines
- Sea level rise
- Biodiversity and Climate Resilience in Saint Vincent and the Grenadines

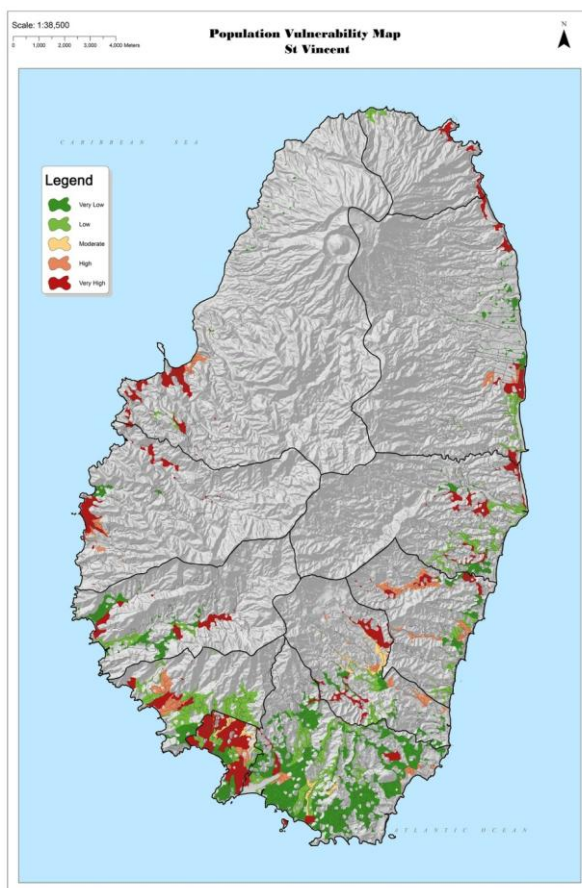
2.1 Vulnerability Context (climatic change and vulnerable sectors)

Climate change will affect the physical and biological characteristics of marine and coastal areas, modifying the structure and functioning of these fragile ecosystems. Their impairment will inevitably to losses in fisheries and coastal-dependent sectors such as tourism. Likewise, wetlands, including reefs, cays and mangroves are among those ecosystems considered to be most vulnerable to climate change because of their limited adaptive capacity. For example, coral reefs are expected to be impacted detrimentally if sea surface temperatures increase by more than one degree Celsius, above the seasonal maximum temperature. In addition, acidification of the ocean will affect the ability of reef plants and animals to calcify and thus reduce the ability of reefs to grow vertically and keep pace with rising sea levels.

Also, in near-shore marine and coastal areas, many wetlands and coastal forests will be affected by changes in sea level and storm surges. Mangroves and coastal lagoons are expected to undergo rapid change and perhaps be lost altogether as functioning ecosystems. Low-lying coastal areas and associated wetlands could also be displaced by salt water habitats, disrupting fresh-water based ecosystems. Such changes are likely to result in dislocation of migratory birds and aquatic species, not tolerant to increased salinity or flooding. The combined pressures of sea level rise and coastal development could also reduce the availability of inter-tidal areas, resulting in loss of feeding habitats to catastrophic declines in wintering shorebirds. Migratory and resident birds, mammals and fish may lose important staging, feeding and breeding grounds that are difficult to replace under competing demands for scarce land. All these may result in impacts to commercially important fish species and a pole-ward shift of marine production, seriously affecting the sustainability of fisheries.

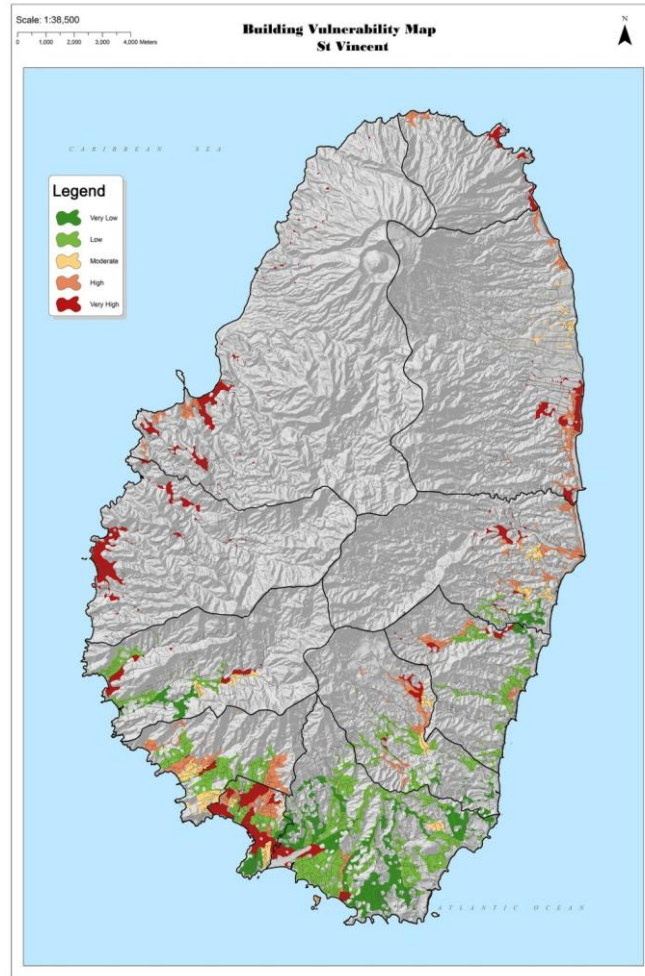
Clearly, Saint Vincent and the Grenadines is highly dependent on the degree of resilience of the natural resource base that supports the key economic sector and activities (especially the tourism, agriculture and fisheries sectors) to the impacts of climate change, climate variability and land degradation land degradation. It is therefore imperative for us to aggressively pursue an integrated development approach that inter alia takes full account of the predicted and actual impacts of global climate change, climate variability and the impacts on biodiversity and land degradation.

Figure 14: Population vulnerability



Population Density per hectare	Vulnerability level	SVG (HA)
0 - 17	Very Low	1424.7
17 - 35	Low	1645.9
35 - 55	Moderate	532.0
55 - 95	High	174.6
95 - 444	Very High	59.2
		3836.4

Figure 15: Buildings Vulnerability



Areal Building Density by ED per hectare	Vulnerability level	SVG (HA)
7.0 -12	Very Low	1569.4
12.0 -18	Low	1417.8
18 - 28	Moderate	624.7
28 - 45	High	133.2
45 - 99	Very High	91.6
		3836.6

Compounding the potential impact of these physical risks, are a number of inefficiencies that need substantive capacity-building, not least of which is the Meteorological Office. The Meteorological Office of Saint Vincent and the Grenadines receives forecasting information from the Barbados Meteorological Office. The primary role of the Meteorological Office is to give advice and provide information. There is one qualified forecaster and Saint Vincent and the Grenadines is not a WMO member. There is no direct linkages to key international warning agencies (hurricane warnings are transmitted from Barbados to the Saint Vincent and the Grenadines Met office, at their convenience).

Prior to Hurricane Tomas passing directly between Saint Vincent and the Grenadines and Saint Lucia, the warning of impending Category 2 Hurricane conditions was only issued a little over 24 hours ahead of time.

Saint Vincent and the Grenadines, together with OECS countries have committed to adopting the ecosystem approach in the form of *Island Systems Management*, as outlined in the Saint Georges Declaration of Principles for Environmental Sustainability. The Declaration defines Island Systems Management as an integrated process of information gathering, planning, decision-making, allocation of resources, actions and formulation and enforcement of regulations related to the linkages in small island states between ecological systems and between these systems and human activities and incorporates terrestrial, aquatic and atmospheric environments.

Systematic evaluation of plans, programmes, policies and projects for their impact on biodiversity and ecosystem services would ensure not only that biodiversity was better protected, but that climate change itself was more effectively addressed. Conservation of biodiversity and, where necessary restoration of ecosystems, can be cost-effective interventions for both mitigation of and adaptation to climate change, often with substantial co-benefits.

None of the current national plans or policies in Saint Vincent has adopted an ecosystem approach. Future operational guidance on how such an approach might be implemented should be undertaken by a collaboration of the appropriate line ministries.

Some tradeoffs between conservation and development are inevitable, and it is important that decisions are informed by the best available information and that tradeoffs are clearly recognized upfront. Therefore, part of “climate proofing” national development will necessarily involve strengthening of systems to monitor the condition of our “natural infrastructure” and to predict whether certain development actions/ decisions are likely to increase or decrease their resilience to climate change.

The table on the following two pages lists the potential climate impacts and possible resilience and adaptation strategies, most of which have been incorporated into the Phase Two implementation. This has been adapted from the Draft Second National Communication for Saint Vincent and the Grenadines, prepared with assistance from the Global Environment Facility (GEF) 2010). The table presents a comprehensive coverage of resilience issues identified by the extensive consultations and investigations necessary to the preparations of the Second National Communications. This is a follow up to the First National Communications submitted in 2002, and is currently in draft form with three chapters completed to date.

Although there is much climatic variation between localities, some factors and characteristics are common to most small islands-mainly as a result of their insular natures and tropical locations. In the tropical of islands in the Caribbean Sea, most islands are strongly influenced by the ENSO phenomenon and associated high inter-annual variations in rainfall and sea level²⁰. The ENSO phenomenon has a strong influence on the weather and climate²¹ in the Caribbean. ENSO events already have been associated with extensive coral bleaching in the Caribbean in the early 1990s.

Changing rainfall patterns, sea level rise, increasing temperatures and extreme weather events are some of the adverse impacts of climate change and climate variability that will have serious

²⁰ Hay et al., 1993, *Climatological Sea-saws in the Southwest Pacific*, Weather and Climate **13**, 9-21.

²¹ Centella et al., 1996, *Variations and Climate Change in Cuba*, National Climate Centre, Havana Cuba, 58pp.

environmental, social and economic consequences in Saint Vincent and the Grenadines. As a result, several sectors are vulnerable. The vulnerable sectors include:

- Water;
- Tourism;
- Health;
- Agriculture;
- Coastal Zone;
- Fisheries;
- Energy; and
- Critical Infrastructure.

It should be noted that the Phase One investigations found a number of opportunities where gender-specific considerations needed to be included in the detailed descriptions of investment initiatives (see Investment Programme – detailed Investment Project activities).

Figure 16: Potential Climate Impacts as possible resilience and Adaptation strategies.

Sector	Existing Legislative Controls	Climate Change Impacts	Resilience/Adaptation Strategies	Existing Responsible Agencies
Coastal Zone Management	Beaches Protection Act, Fisheries Act, Maritime Areas Act	<ul style="list-style-type: none"> ▪ coastal flooding ▪ coastal erosion (beach loss) ▪ aquifer pollution from saline intrusion (Grenadines) ▪ damage and ongoing threats to coastal infrastructure ▪ loss and damage to fisheries resources ▪ patterns of tropical storms increasing in severity 	<ul style="list-style-type: none"> ▪ coastal zone Plan of Management – i) Saint Vincent, and ii) the Grenadines ▪ coastal controls in legislation to guide land-use planning along the coast (setbacks, development standards, waste water disposal on the coastline, drainage plans etc.) ▪ aquifer protection from saline intrusion (Grenadines), water management plans and guidelines for communities ▪ beach and coastal management strategies to minimise loss of sand and amenity in general (dune stabilization, vegetation replanting etc.) 	Fisheries, National Parks
Watershed Management	Central Water and Sewage Authority Act, Forest Resource Conservation Act	<ul style="list-style-type: none"> ▪ diminished dry season volume in streams ▪ changes in seasonal rainfall patterns and drying streams ▪ aquifer pollution from saline intrusion (Grenadines) ▪ damage and ongoing threats to water storage (reservoir) infrastructure ▪ loss and damage to agricultural resources and coastal flooding ▪ rapid evapo-transpiration and drying trends ▪ expected increase in hurricane activity ▪ possible increase in el Niño effects 	<ul style="list-style-type: none"> ▪ watershed Plan of Management – i) Saint Vincent, and ii) the Grenadines ▪ development or rainwater harvesting systems, water storage, water conservation, water recycling, knowledge management– i) Saint Vincent, and ii) the Grenadines (see CEHI and FAO projects?) ▪ investigation of the need for watershed rehabilitation, stabilization and conservation ▪ feasibility studies of potable water systems (desalination, groundwater, rainfall catchment) 	CWSA, Forestry, National Parks
Agriculture	Crown Lands Act, Plant Protection Act, Customs Act	<ul style="list-style-type: none"> ▪ diminished yields – increased food importation ▪ spread of plant pathogens ▪ decline in soil fertility ▪ change in diet and accompanying health and economic challenges ▪ need for increased irrigation 	<p>sustainable water management for agriculture (irrigation)</p> <p>integrated pest management strategies</p> <p>diagnostic lab for agricultural testing and monitoring (inclusive of water quality monitoring)</p> <p>linkages to breeding programmes for farm animals elsewhere in OECS</p>	Agriculture, Customs

		i) Saint Vincent, and ii) the Grenadines	cooperative research into economically feasible crops (germplasm research) investigations into alternative cropping, products and techniques (Permaculture) for local consumption and possible export	
Tourism	Tourist Board Act, National Parks Act, Marine Parks Act, Tobago Cays Regulations, Port Authority Act	<ul style="list-style-type: none"> ▪ continued loss of beach (size, quality, amenity) and coastal flora and fauna ▪ decreased regeneration of corals and marine ecosystems ▪ loss of biodiversity and deterioration of natural sites (land-based) from lower rainfall, increased extreme weather ▪ Fear of safety and security from increased hurricane intensity ▪ possible tourist decline due to increased temperatures ▪ patterns of tropical storms increasing in severity (tourism impacts) 	<ul style="list-style-type: none"> ▪ intensive physical beach conservation actions ▪ public education for beach visitors (signage, info brochures) on beach conservation ▪ strict controls on recreational boating for anchoring, discharge, solid waste disposal etc. (both incentive and regulatory controls) ▪ knowledge and information available to tourists during hurricane season (most vulnerable persons of all) ▪ further development of National Parks and Marine Parks to protect valuable natural areas 	Ministry of Tourism, Tourism Authority, National Parks, Port Authority
Health and Social issues	Environmental Health Services Act, Litter Act, Wildlife Protection Act	<ul style="list-style-type: none"> ▪ Vector borne diseases likely to increase ▪ Possible health and sanitation dangers as a result of decreased rainfall and water availability ▪ Potential dangers to elderly and home-bound women from heat exhaustion from increased temperatures ▪ Decrease in food security ▪ Economic decline from falling farm and agricultural production ▪ Increased food bills and possible unemployment 	<ul style="list-style-type: none"> ▪ Knowledge base and mitigative measures for dengue fever and other vector diseases ▪ Refurbish hurricane shelters to accommodate basic health facilities ▪ Strengthening of roving clinics ▪ Proactive disease control measures 	Health Wellness and Environment, National Parks
Cross-sectoral Issues	various	<ul style="list-style-type: none"> ▪ Weather information services not providing adequate and timely information ▪ Disaster risk reduction not adequately addressing climate change 	<ul style="list-style-type: none"> ▪ Support to Met Office ▪ Support to NEMO ▪ Climate change awareness and capacity building in most Ministries 	all

		<ul style="list-style-type: none">▪ patterns of tropical storms increasing in severity (impacts on all sectors of the economy)		
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Source: Adapted from the Draft Second National Communications, Saint Vincent and the Grenadines, for Global Environment Facility (GEF) 2010)

2.2 Vulnerable Coastal Areas

Coral reefs are significant contributors to the economic resource base of Saint Vincent and the Grenadines. They represent one of the most important resources of tropical islands in the Caribbean. They supply sand to beaches and form and maintain reef islands such as many of the Grenadines; they are marine habitats; and are spawning and nursery grounds for fish. Reefs also provide protective barriers for beaches and coasts by reducing incident wave energy. Therefore, as reefs have deteriorated in Saint Vincent and the Grenadines (negative forces including elevated seawater temperature and anthropogenic stresses), so have the nearby coastal (natural) resources.

Given current projected rates of increase, sea-level rise per se is not expected to have widespread adverse effects on coral reefs. The climate change effect of greatest potential significance to coral reefs is likely to be an increase in seawater temperature. As patterns of tropical storms are increasing in severity, reef ecosystems will be severely affected. Preparedness for hurricanes is therefore a priority for residents and businesses (including farming) in both coastal and inland areas. The Red Zone maps to follow indicate these specifically vulnerable coastal areas.

A recent vulnerability assessment (2007) for the coastal sector suggests vulnerability levels for the following sectors:

- hotels and restaurants - high;
- marinas - high;
- human settlements - medium to high;
- coastal protection structures and sea defences high;
- ports - medium to high;
- fisheries infrastructure - medium;
- fisheries - high;
- coastal ecosystems - medium.

Although groundwater is not a major source of fresh water in the Grenadines, the coral islands and atolls are particularly sensitive to changes in groundwater recharge (and salination) where groundwater sources are utilised as a fresh water source (Bequia, Union).

Sea-level rise may precipitate the intrusion of saltwater into the freshwater lens, reducing the quality and quantity of potable water, if the recharge rate or the width of the island is reduced. Various options have been suggested for minimizing the effects of climate change on water resources in small islands²² such as the Grenadines.

The capacity of mangrove forests (small pockets only remaining in the Grenadines) to cope with sea-level rise is higher where the rate of sedimentation approximates or exceeds the rate of local sea-level rise. Snedaker²³ (1993) argues that mangroves in the Caribbean are more likely to be affected by changes in precipitation than by higher temperatures and rising sea levels because they require large amounts of fresh water to reach full growth potential.

The biodiversity of islands also could be adversely affected by climate change including; alterations in population size, species distribution, species composition, the geographical extent of habitats and ecosystems, and a likely increase in the rate of species extinction.

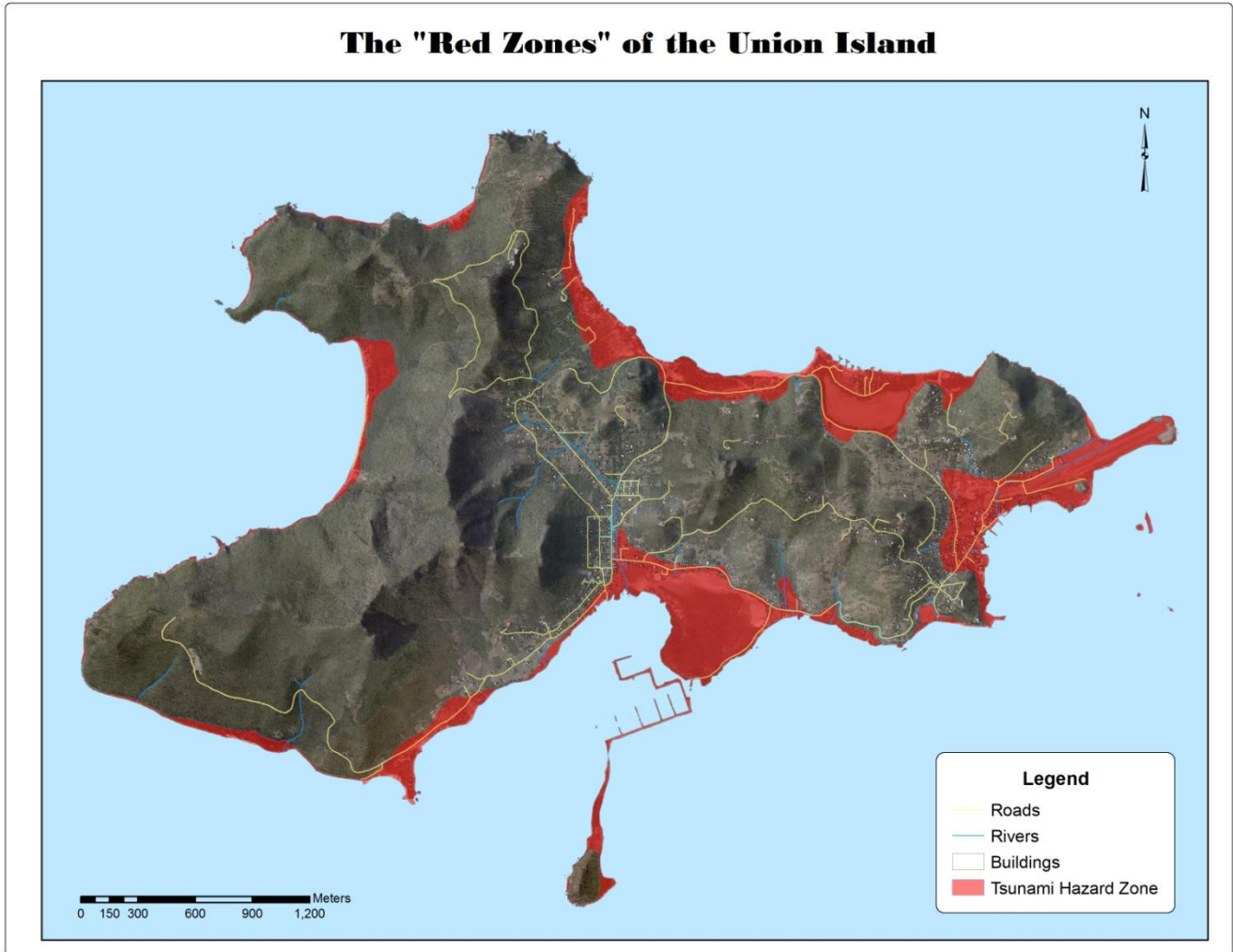
Evidence has indicated that the sea grass meadows in the shallow, intertidal coastal environments, are the ecosystems most likely to be negatively affected by climate change impacts. In Saint Vincent and

²² IPCC 1996, WG II, Section 12.5.5.

²³ Snedaker (1993) in *Regional Impacts of Climate Change: An Assessment of Vulnerability*, IPCC, 1998.

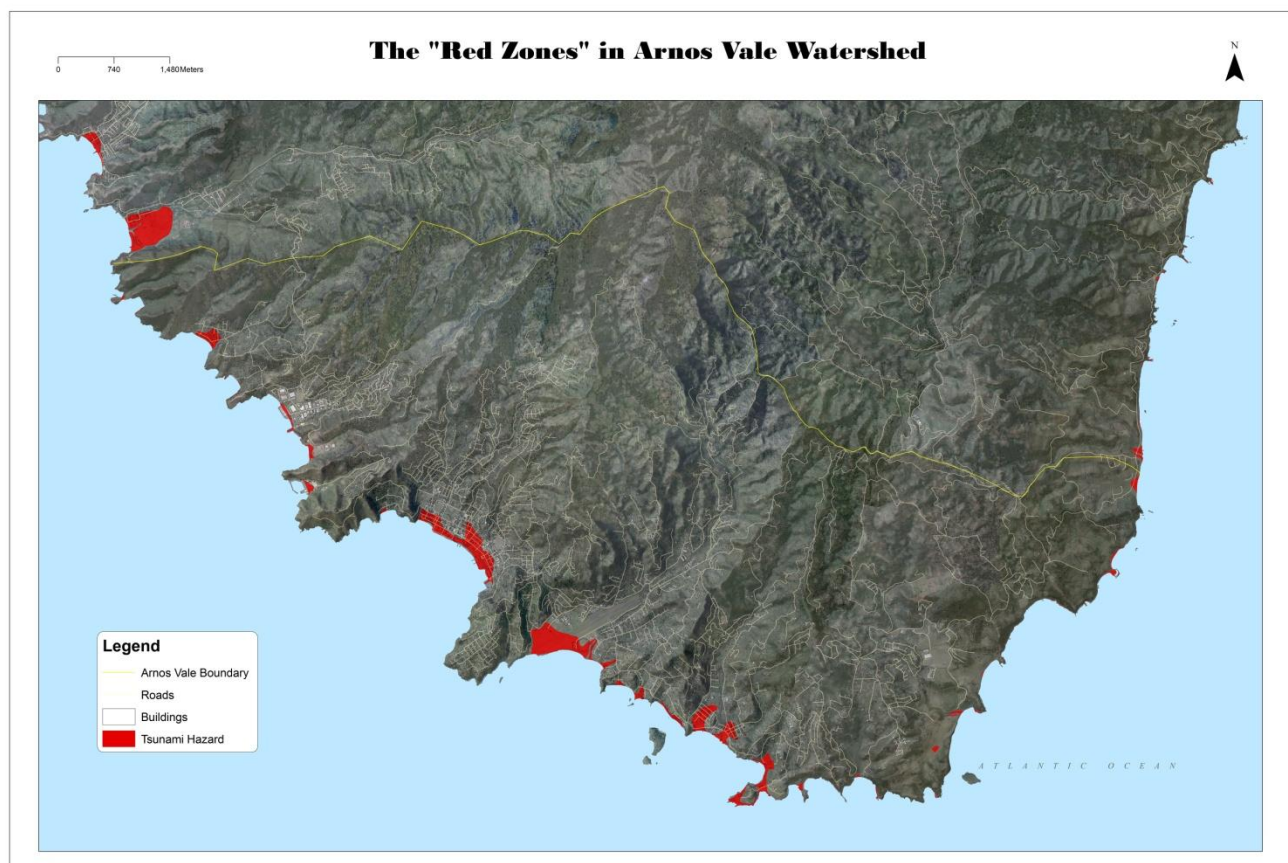
the Grenadines, the main threats to sea grasses in the future are likely to come not from the effects of climate change but from anthropogenic disturbances-such as dredging, sand mining, overfishing, water pollution, recreational boating and land reclamation. The combined effect is therefore significant.

Figure 17: The Red Zones in Union Island



Facilities	No. at Risk
No. of Schools	3
No. of Building	1796
Total Length of Roads (km)	28

Figure 18: The "Red Zone" in Arnos Vale



Facilities	No. of assets at risk
No. of Schools	4
No. of Shelters	6
No. of Medical Facilities	2
No. of Building	1450
Total Length of Roads (km)	20.9

Figure 19: The "Red Zone" in Georgetown



Facilities	No. of Assets at Risk
No. of Schools	1
No. of Shelters	1
No. of Medical Facilities	1
No. of Building	663
Total Length of Roads (km)	7

2.3 Inland Areas

The tropical inland forests are likely to be affected more by changes in soil water availability (caused by the combined effects of changes in temperature and rainfall) than by changes in temperature alone. It is possible that tropical forests will be affected more by anthropogenic forces than by climate change. Increasing temperature and extreme events (hurricanes, high wind conditions, landslides) also may increase the incidence of pests and pathogens, as well as the frequency and intensity of fires²⁴.

²⁴ On the other hand, increasing amounts of CO₂ may enable some forest species to use water and nutrients more efficiently (IPCC 1996, WG II, Section 1.3.7).

Biodiversity

A large number of species of flowering plants, ferns, amphibians, reptiles, birds, and mammals have been identified in the country.



Figure 20: The Saint Vincent parrot, *Amazonia guildingii*

The national bird, the Saint Vincent Parrot *Amazona guildingii* is protected through the designation of a parrot reserve - an area of close to 4452 ha in the upper watersheds of the Buccament, Colonarie, Richmond, and Cumberland Rivers in the central mountains. Populations of agouti *Dasyprocta agouti*, iguana *Iguana iguana*, opossum *Didelphis marsupialis* and armadillo *Dasypus novemcinctus* provide a base for recreational hunting during the open season (October 1 to January 31). Twenty-three (23) Wildlife Reserves have been declared throughout the country under the Wildlife Protection Act no. 16 of 1987. The Legislation also affords various degrees of protection to wildlife on an annual basis.

Natural vegetation

Most of the natural forest is found in the central mountain areas of Saint Vincent. According to the National Forest Inventory completed in 1993, the total forestland area in 1992/1993 was approximately 12,683 ha and consisted of Primary rainforest (4,306 ha), Secondary rainforest (3,450 ha), Dry Scrub Woodlands (2,178 ha), Palm Brake forest (518 ha), Elfin Woodland (457 ha), Regenerated areas (1,775 ha). The King's Hill Forest Reserve, established in 1791, is the only other significant area of natural forest in the country.

In the Grenadines there are few areas of natural forest cover, as unrestricted grazing has resulted in widespread loss of vegetative cover (Delegation of the European Commission in Barbados and the Eastern Caribbean, 2004). Littoral Woodland covers small areas of the islands.

Agriculture

The agricultural sector and, in particular, the banana industry has contributed immensely to the economic development of Saint Vincent and the Grenadines in the last three decades. It provides income, employment and improved welfare for the Vincentian society. During the last decade however, the sector's relative contribution to GDP has declined.

This decline in the agricultural sector's contribution to GDP is closely linked to a decline in the productivity of the banana industry. Since 1993, the banana industry has struggled to adjust to ever-changing market conditions in Europe, including more stringent quality standards, greater competition and lower prices (see Interim Poverty Reduction Strategy Paper, 2003).

Agriculture however remains the largest employer and contributes 10% of GDP²⁵ in Saint Vincent and the Grenadines. As the economy diversifies and as trade liberalisation globally undercuts agricultural exports (especially bananas), the sector's share of GDP and its contribution to employment have been falling over the years. For instance, in 1992, the last year before the commencement of the erosion of the trade preferences for bananas, Saint Vincent and the Grenadines exported 79,000 tons of bananas with a value of EC \$ 120 million, from which 8,000 farmers benefited. By 1995, the export volume had fallen to 50,000 tons produced by 5,000 farmers at a value of EC\$ 50 million (USmillion\$18.7) . In 2004, the export volume was projected to be 28,000 tons, produced by 2,500 farmers at a value of roughly EC\$ 30 million (USmillion\$11.2).

Landslides and erosion

Although the total annual rainfall for Saint Vincent and the Grenadines has shown little change over the last twenty-five (25) years, the pattern has changed significantly. Instead of six months of almost evenly distributed rainfall, the country now experiences short periods of torrential downpours followed by seven to nine months of little or no precipitation. The resulting heavy run-off causes much erosion because due to extensive clearing for agriculture and housing.

Landslides occur throughout the mainland mainly during the rainy season because of the mountainous topography and the instability of slopes. The Grenadines are affected to a lesser extent by landslides because of their gentler topography and less intensive rainfall.

On mainland Saint Vincent, the immediate issue is not water shortage but over exploitation or inappropriate use of land. In this regard, farming on steep slopes (e.g. La Soufriere and Mount Saint Andrews) has resulted in serious soil erosion and fertility loss.



Figure 21: Landslide at falls of Baleine

2.4 Water: a future risk

It is highly probable that the effects of climate change will lead to adjustments in the global hydrological cycle, which could affect the distribution and availability of regional water resources.

²⁵ See Section 1.7 on Agriculture also.

Temperature variations can result in changes in evapotranspiration, soil moisture, and infiltration rates²⁶.

Options to mitigate future risk (including planned adaptation) of dwindling fresh water supplies that the PPCR Phase II will evaluate, include the harvesting of rainwater, more efficient and extensive use of surface water, artificial recharge of aquifers with rainwater or treated wastewater, and more efficient management of existing supplies and associated infrastructure (e.g., use of various water-saving devices, reduction of leaks, replacement of worn pipes, and recycling).

Adaptation options may include: reducing water pipeline leakage; active and effective rainwater harvesting, water conservation in the home and for businesses; needs assessment for water storage facilities; evaluate the costs of water supply; restoration of riverbanks and wetlands water conservation; public awareness; improved management of forest resources including private forests; strengthening data collection; and, the possible development of a national water management plan for Saint Vincent and the Grenadines.

The water resources sector is faced with some key threats such as:

- Inadequate ground water data and analysis
- Lack of a systematic river or ground water quality monitoring program
- Inadequate density of hydro-meteorology, climatic and agro-climatic stations

As a result, the three main challenges of water resources management can be categorized as:

- I. Ensuring that the water resources are managed so as to maximize the contribution that these natural resources can make to increase the productivity of the economies of the nation
- II. Managing the water resources so as to maximize their contribution to the elimination of poverty and to raising the quality of life, and
- III. Ensuring that water resources are managed so as to minimize the impact of water-using economic activities on the quality of the environment

Therefore, there is the need to manage water resources to:

- Safeguard existing water rights
- Improve knowledge of availability and reliability (quality and quantity) of water
- Safeguard environmental aspects
- Prevent conflict between competing users
- Prevent over-exploitation

At present there are a number of institutions with some responsibility for water resources investigation and protection, and there are some overlaps and omissions in the attendant legislation. Furthermore, owing to financial and other resource constraints vis-à-vis the wide range of responsibilities to be addressed by an institution, most of them are limited in the extent to which they can fulfill existing mandates for water-resources-related tasks. For example:

Forestry Department: Unable to properly execute its mandate regarding the protection and preservation of water resources in forest reserves. There has been however a number of relevant projects and initiatives in the forestry and watershed management sectors in Saint Vincent and the Grenadines over recent years. The SPCR proposed investment projects build on these initiatives to make best use of these resources.

²⁶ IPCC 1996, WG II, Sections 10.1, 10.3, 10.4.

Environmental Health Division (Ministry of Health): Only handles “certificates of approval” for the discharge of liquid wastes from animal farms, not domestic or industrial premises

CWSA: Has not fully activated its mandate regarding investigation of water resources

National Parks, Beaches and Rivers Authority: Is not equipped to exercise “power and control over all rivers, streams, etc.,”

Physical Planning and Development Board Has difficulty following up and enforcing planning legislation, especially regarding design and sizing of domestic septic tanks and soakaways;

There is clearly a need to review these tasks to see if a particular institution should be strengthened to properly meet its responsibilities, or alternatively, to consider whether or not some tasks should be transferred to another agency.

2.5 Gender and the Impacts of Climate Change

According to the Millennium Development Goals Report by ECLAC (2009) 68% of female heads of households have never been married, and 18% of them are previously married or separated. Coupled with higher unemployment rates among women, these households are most vulnerable to climate change. These suffer the most during any kind of natural disaster, particularly in cases of lack of access to resources and lack of adequate finances to procure food, medical attention and water (CIDA, 2005).

Climate change does not affect men and women in the same way and is likely to have a differentiated impact also in St. Vincent and the Grenadines. Therefore, all aspects related to climate change need the inclusion of gender perspective. Gender-specific implications of climate change outcomes on human, food, biomass energy and livelihood security, are well documented. Due to climate induced events like food, drought, hurricane, volcanic activities, heat wave, etc. women and children will suffer earliest and most. It is also believed that increase in climate induced natural disasters is likely to affect women more than men. In addition, there are some specific gender attributes, which increase women’s vulnerability in some respects.

Women tend to be disproportionately affected during post disaster period. This includes food and drought induced food insecurity, collection of safe drinking water, sanitation problem, energy insecurity, reproductive and maternal health problems, mental and physical trauma, sexual harassment, etc. Moreover, there is need to more amply incorporate gender sensitivity into climate change programming in St. Vincent and the Grenadines. In light of the above situation, several areas required specific attention, which are: gender-specific effects of climate change; climate vulnerability related to gender aspect; women’s capacity to adapt with climate induced natural disasters and extreme events; gender and decision-making on climate change; and gender-specific role in adaptation and mitigation.

Poverty:

The level of poverty in Saint Vincent and the Grenadines would present significant problems for climate resilience. In accordance with the approach employed by the World Bank, a National Survey conducted in the 1990’s (Poverty Assessment Report, Saint Vincent and the Grenadines” Kari Consultants 1996), estimated that 35% of households in Saint Vincent and the Grenadines could be categorized as poor. This figure is also adopted in a 2003 report (see Interim Poverty Reduction Strategy Paper, National Economic and Social Development Council, 2003).

A recent (February 2011) Damage and Loss Assessment (DALA) report by a consortium of Multilateral Development Agencies (UNDP, UNECLAC and Others) did some post Hurricane Tomás evaluation. Among other things, the report shows that there is a positive correlation between the extent of poverty and the extent of damage or loss. The poorer areas were the areas most adversely affected by the Hurricane. Although geographic location in the country has some bearing (the eye of the storm passed closer to the north which incidentally are the poorer areas) The size of the storm meant that the entire mainland received strong winds and rain but were more resilient.

People living in poverty contribute least to climate change but they are likely to suffer its worst consequences with few resources to adapt and respond. The effects of climate change – increasingly limited access to water, reduced crop yields, more widespread diseases, increased frequency of natural disasters are making the lives of poor people even more precarious. High levels of poverty and low levels of human development limit the capacity of poor households to manage climate risk. With limited access to formal insurance, low incomes and meager assets, poor households have to deal with climate related shocks under highly constrained conditions. Adaptation to climate change will only be effective if it builds upon an understanding of the multidimensional nature of poverty and vulnerability. Adaptation to climate change must be considered as part of the development process and not separated from it so it will therefore have to be integrated into national economic planning and poverty eradication.

In the St. Vincent and the Grenadines Country Poverty Assessment 2006 (Kairi Consultants) it was revealed that 30.2 percent of the population is poor: this is the percentage of the population that did meet the minimum annual consumption expenditure of \$5,23, required to satisfy the basic food, as well as non-food requirements. In terms of geographical distribution of poverty, the census divisions of Georgetown and Sandy Bay which together comprised 9.0 percent of the population accounted for as much as 16.5 percent of the poor.

The Country Poverty Assessment 2008 indicated the following:

- 30.2 percent of the population was deemed to be poor in 2008, and 2.9 percent was deemed to be indigent.
- An additional 18 percent, though not poor were vulnerable (defined as being at risk of falling into poverty in face of economic shock, or other **disaster**): altogether 48.2 percent of the population was under the vulnerability line.
- The highest incidence of poverty was found in Georgetown/Sandy Bay area- 55.6 percent of residents in this district were deemed to be poor.

St. Vincent and the Grenadines will need the assistance of international community in continuing its efforts at poverty reduction. The Government, through its agencies, has mounted a vigorous programme of poverty reduction the fundament of which is to stimulate the growth of competitive industry and of new export activity. There are a number of agencies in the NGO community that have also been engaged in major programmes, to the extent that their resources allow it. In St. Vincent and the Grenadines it will be necessary to promote and facilitate public awareness programmes on climate change. Further greater public access will be needed on information on climate change and its effects.

2.6 The Economic Rationale of Adaptation

There is a shared and global concern that the overall costs of adaptation measures such as infrastructure protection will be beyond the financial means of any island nation, Saint Vincent and the

Grenadines included. Vulnerability studies conducted in Saint Vincent and the Grenadines suggest that the costs of coastal protection ("hard" options) would be a significant proportion of GNP²⁷.

The costs of protecting the shoreline and other infrastructure will vary, depending on the kind of protection needed, the length of area to be protected, design specifications to be adopted, and the availability of construction materials.

The Caribbean region suffered considerable damage from severe hurricanes (e.g., David, Hugo, Gilbert, Gabrielle, Luis, Marilyn) in the 1980s and 1990s. As a direct result, many insurance and reinsurance companies withdrew from the market. Those companies that stayed in the market (primary insurers in particular) imposed burdensome conditions for coverage such as higher deductibles; increased rates for windstorms; and insertion of an "average" clause to eliminate the possibility of underinsurance²⁸.

The cost of insurance is therefore an important factor to take into consideration in any assessment of climate change impacts on infrastructure. Property insurance is extremely sensitive to the effects of catastrophic events such as hurricanes, floods, and earthquakes with high-risk locations demanding higher and higher insurance premiums. In Saint Vincent and the Grenadines, the primary insurers need to be brought into the conversation on climate change and given the opportunity to work alongside policymakers to reduce the potential future losses from the impacts of a changing climate. This process has commenced with the recent initiative of the Ministry of Health and Environment staging a conference on the topic in early February 2011.

The major costs of adaptation in Saint Vincent and the Grenadines are associated with upgrading of critical infrastructure. Roads, bridges, culverts, embankment stabilization, coastal and river defences and relocation of buildings and infrastructure: these are the hard costs. The softer costs are what will contribute most significantly to building and sustaining climate resilience. This includes the development of awareness, knowledge and understanding amongst businesses, families and communities living and working in vulnerable areas. Knowledge management is probably the investment that will provide the greatest return. Curriculum development for schools (high schools at the outset) is a wise investment, recognized as a necessary addition to the National Three Year Programme to build climate change and resilience knowledge and awareness.

The PPCR has taken a comprehensive approach by including some necessary hard costs (around forty percent of the budget) that is supported by a range of training, capacity building, data management, knowledge management and policy support activities. The softer costs included in the PPCR will contribute directly to the sustainability of the investments made under the Disaster Vulnerability Reduction Project (see Annexes). In all, the total costs of all measures and investments proposed in the PPCR, will make a significant start to the transformation of Saint Vincent and the Grenadines into a climate resilient population, an example to all of the Caribbean and indeed, small island states around the world. This is the vision and this is a leap forward in achieving that vision.

²⁷ See also projected costs for other SIDs in IPCC 1996, WG II, Table 9-3.

²⁸ See Murray, 1993; Saunders, 1993.

3. Linkages to National Development Plans and Past Projects/Programs

3.1 Links to the PPCR Regional Track

In May 2009, the Caribbean agreed to be one of two Regional Track pilot programs. The Regional approach addresses i) country investments in six vulnerable nations, and ii) region-wide activities addressing climate risks and vulnerabilities common to all Caribbean countries.

Stakeholders came together late 2009 and agree on five regional actions to focus on:

1. Monitoring and climate modelling
2. Policy and institutional framework
3. Up-streaming sustainable land management
4. Capacity building
5. Mainstreaming to integrate climate change

The PPCR Regional Track Phase I proposal is still under preparation. This will be overseen by the IDB. There are clearly a number of 'commonalities' that will be shared by the National SPCRs, and the Regional PPCR. This would include, but not limited to the following:

Climate Risk Analysis

The analysis of the regional potential and existing impacts of climate change will most certainly be shared and similar for the OECS countries and in fact all Caribbean countries. Similarly, the National analysis of climate risks (the climate science especially) will be also largely common to the OECS countries.

GIS data sharing

It may be of significant (regional) value to share the respective GIS and data management needs/gap analyses undertaken by all regional participating countries. This should indicate likely actions best undertaken collectively (regional) and those that are country-specific (national).

Legislative review

Amongst many of the English-speaking countries of the Caribbean, there is a common basis of legislative instruments and controls. Investigations and review could therefore be undertaken for all those countries simultaneously.

Tourism

Indeed, issues regarding climate change impacts on tourism, tourism locations and tourists' behaviour (e.g. arrivals forecasting), and the need to build resilience in this significant economic sector are also likely very similar between the Caribbean countries. There is an opportunity to streamline this sector analysis to share amongst all PPCR countries.

Consultation processes

The strategy for how to achieve an acceptable level of consultation and participation of stakeholders (public and private) in the PPCR planning and development process, could be shared amongst all countries for example.

Private Sector

The opportunities for actively and meaningfully engaging the private sector should also be shared amongst all countries.

In addition, the identification of priority hazard maps, and indeed all relevant climate and disaster data sets need to be made available to the Regional Track. Proposed training activities included in the investment programmes should also be shared and indeed, be the basis of the Regional Track training strategy. It would simply make good business sense to conduct collective trainings to build intra-regional cooperation amongst all SPCR countries.

The following list, drawn from the Saint Vincent and the Grenadines Phase One Proposal (November 2010), summarises those regional activities already identified. It should be noted that many of these suggested initiatives have been included in the Investment Programme (see specific reference to OECS Education Reform Unit, CDEMA, CDC, PAHO, UWI, CIMH, Barbados Coastal Zone Management Unit, 5C's and other organizations in Components One through Four).

1. Monitoring and climate modeling activities

- 1.1 Strengthening climate change modeling and monitoring capacity of regional organizations or regional group – e.g. strengthen the modeling group of CCCCC/UWI/ISMNET.
- 1.2 Development of standards/protocols for collecting and managing data – this would also include improving the human and institutional capacity to collect and manage data. Development/implementation of Disaster Risk Management and Climate Change adaptation indicators in key economic sectors. Within this context, there could be the development of standards/protocols related to monitoring, evaluation and reporting of these indicators.
- 1.3 Strengthening monitoring capacity by increasing the number of monitoring stations in the Caribbean especially in those countries with very limited resources e.g. Haiti. Provide pertinent training of maintenance, data collection and analysis.
- 1.4 Strengthen linkages between regional modeling and monitoring networks with the PPCR pilot countries.

2. Enabling environment (policy and institutional framework)

- 2.1 Expansion of the Comprehensive Disaster Risk Management program in the Caribbean; Insure greater integration of DRM approaches with measures to integrate resilience to climate change (including measures to manage the impacts of climate change over the medium and longer-term) in the Caribbean, consider using pilot countries of the PPCR as case studies.
- 2.2 There is an opportunity for the expansion of policy/legal framework to deal with issues related to climate change e.g. revamping of the land use or spatial planning legislation in the Caribbean to incorporate climate change resilience; development of new land codes/practices and guidelines.

3. Raising the Political Profile of the Importance of Factoring in Climate Risks into Sustainable land-use management and Spatial Planning

- 3.1 What are the outreach opportunities or options for “upstreaming” the issues to the political level?
- 3.2 What is the role of regional organizations to facilitate awareness raising at the political levels?

4. Capacity building and awareness raising aimed at different levels, including sectors and policy makers)

- 4.1 Development and/or expansion of a platform for sharing information/data/best practices/case studies to all members states (in all major languages used in the Caribbean – English, French, Spanish and Dutch). Is there an existing platform that can be used for these purposes?
- 4.2 Development of practical/user-friendly climate change training packages for:

- Policy/decision makers of key vulnerable economic sectors
 - High level politicians
 - Public awareness and communities
- 4.3 Provide training on climate change modeling to scientists in the Caribbean (particularly those who are not part of the Caribbean climate modeling group and may have less capacity).
- 4.4 Provision of “adequate information” on climate change and the impact of climate change in selected productive sectors.
- 4.5 Strengthening regional coordination, planning and active participation in the UNFCCC.

5. How to integrate climate change into development and budget planning

- 5.1 Enable dialogues at the regional level with policy makers from different sectors – Planning, Finance, Agriculture, Education, Water, etc.)
- 5.2 Need for innovative financial mechanisms to support the implementation of adaptation measures in the different sectors e.g. explore use of carbon taxes/levies and how PPCR can provide seed funding to support piloting and/or scaling-up of such financial mechanisms.

Following recent discussions with the Lead Consultant for the Regional Track (as this process is just coming on line at the time of writing this document), several opportunities were identified where the Regional Track could “add value” to the on-going National SPCR preparations.

Needless to say, the Regional Track will need to thoroughly consider the specific needs of the nations that make up the pilot countries to which the regional initiatives will serve and respond, as indicated in the summary below²⁹:

The Regional PPCR is intended to:

- *Pilot and demonstrate approaches for integration of climate risk and resilience into development policies and planning;*
- *Strengthen capacities at the national levels to integrate climate resilience into development planning;*
- *Scale up and leverage climate resilient investment, building upon other ongoing initiatives;*
- *Enable learning by doing and lesson sharing at the country, regional and global levels;*

Strengthen cooperation and capacity at the regional level to:

- *integrate climate resilience in national and appropriate regional development planning and processes.*

Three modules of Phase I Regional Track activities are approved for the regional programme as follows:

Module 1: Capacity Development and Information Sharing

1. *Support for Strengthening of data management capacity.*
 - a. *Evaluation of data collection and management systems and processes;*
 - b. *Workshop on climate modeling and monitoring systems.*
2. *Identification of Data Needs.*
3. *Information sharing and exchange of best practices.*
 - a. *Assessment of need for additional functionality of the information clearing house.*

Module II: Advocacy and policy development

²⁹ Pilot Programme for Climate Resilience, Caribbean Regional Track First Progress Report, Prepared by Patricia Mendoza, PPCR Regional Coordinator, Submitted to Gerard Alleng, Copied to Dr. Neville Trotz, IDB PPCR Caribbean Coordinator, Caribbean Community Climate Change Centre Inter-American Development Bank, Washington, D.C., February 7th, 2010.

1. *Regional Policy Dialogue.*
2. *Stakeholder consultations.*
3. *Development and piloting of climate risk screening toolkit*
 - a. *Piloting of screening tool.*
 - b. *Formulation of toolkit.*

Module III: Coordination, scoping and SPCR preparation

1. *Coordination and national programs interface*
 - a. *Participation in joint missions.*
 - b. *Support to the development of regional results framework.*
 - c. *PPCR Phase I coordination and transition to PPCR Phase II.*
2. *Gap Analysis of climate resilient systems, capacities and practices in the PPCR pilot countries.*

As the Regional Track gathers momentum, opportunities to provide practical measures to guide these modules into actions will emerge from the specific needs and demand from the countries that form this regional group. There is a significant potential cost saving and economy of scale advantage to undertaking certain activities that each of the National SPCRs have identified as having a regional component. The networking and exchange should begin immediately and the added value of the Regional Track provided to the National SPCRs as soon as practicable.

3.2 Participation in International Discussions and Agreements

The Government of Saint Vincent and the Grenadines has taken several credible initiatives particularly for adaptation and has managed to draw international attention and cooperation to address climate change adaptation in Saint Vincent and the Grenadines. The country acceded to the United Nations framework Convention on Climate Change (UNFCCC) in 1996. The county ratified the Kyoto Protocol which was signed on 19th March 1998 and ratified on December 2004. Government of Saint Vincent and the Grenadines has submitted the Initial National Communication to UNFCCC in 2000 and is now preparing its second national communication, which will is likely to be completed by this year (2011).

Saint Vincent and the Grenadines has been a participant in the International discussions on climate change. For example, Saint Vincent and the Grenadines actively took part in climate change talks in COP 14 in Poznan in December 2008 and COP 15 in Copenhagen in December 2009 and made submission for negotiations that has entered a critical phase now. The Government is firmly committed to implementing of an integrated policy and plan to protect the country from the adverse effects of global warming as well as to ensure food for all, eradicate poverty, create enabling environment for increased employment, and guarantee access to energy and power. The Government's strategy is to integrate climate change challenges and opportunities in the overall development plan and programs involving all sectors and processes for economic and social development.

The initial National Communication submitted in 2000 (and the DRAFT Second National Communication) on climate change are reports which are submitted to the UNFCCC to provide information on the progress made on the implementation of the Convention at the national level, the vulnerable sectors have been identified in these documents. The PPCR builds on the vulnerability and adaptation assessments and identifies areas within the different sectors where possible concrete adaptation measures can be undertaken.

St Vincent and the Grenadines has signed unto and have ratified many conventions, protocols and agreements in support of climate combating the effects of and building resilience to climate change and disaster risk reduction. Inter alia, St Vincent and The Grenadines acceded to the United Nations Framework Convention on Climate Change in 1996. The matrix below represents a compendium of

conventions, protocols and agreements that the country has signed/ratified. It must be noted that the development of the PPCR was guided by the mandates and imperatives of these international discussions and agreements.

Convention/Protocol/ Agreement	Purpose	Date of Signature/ Ratification
UN Framework Convention on Climate Change	Convention on adaptation measures that may be taken to reduce the potential impacts of climate change and climate variability. This convention and its protocol seek to control the emission of greenhouse gases. The Government of SVG and the private sector are taking measures to reduce greenhouse-gas emissions.	1996
Hyogo Framework of Agreement (HFA)	Global Disaster Risk Reduction	2002
The Basel Convention on the Control of Transboundary Movement of Hazardous Waste.	<i>Control of Transboundary Movement of Hazardous Waste and their Disposal (1989).</i>	1989
The United Nations Convention on Biological Diversity (CBD).	This convention seeks to protect flora and fauna and their habitats from destruction by man. The Government of SAINT VINCENT AND THE GRENADINES is currently preparing its report on biological diversity as part of this convention.	1989
The Vienna Convention on the Protection of the Ozone Layer	Protection of the ozone layer will reduce ultraviolet radiation. SVG has in place a programme to phase out the use of ozone-depleting substances under this convention.	1985
The United Nations Convention on the Law of the Sea (UNCLOS)	This convention prescribes jurisdictional rule for the protection of the marine environment. UNCLOS obligates coastal member states to “protect and preserve the marine environment”. This convention provides the framework for the Exclusive Economic Zone.	1982
The International Convention for the Prevention of Pollution from Ships (MARPOL).	Enforcement of this convention will protect aspects of coastal resources against marine pollution.	1973

Figure 22: Conventions, Protocols and International Agreements for Saint Vincent and the Grenadines

3.2a CARICOM and OECS Participation

The Liliendaal Declaration was issued by the Heads of State of Government of the Caribbean Community (CARICOM) at the thirteenth meeting of the conference in Liliendaal, Guyana from 2-5th July 2009. The declaration recalled the objective, principles and commitments of the UNFCCC and its Kyoto protocol. It emphasized that dangerous climate change is already occurring in all SIDS (small islands and low-lying coastal developing states) and that many SIDS will cease to exist without urgent, ambitious and decisive action by the international community to reduce global greenhouse gas

emissions significantly and to support SIDS in their efforts to adapt to the adverse impacts of climate change, including through the provision of increased levels of financial and technical resources.

The Declaration also indicated that the estimated total annual impact of potential climate change on all CARICOM countries is estimated at US\$ 9.9 billion in the total gross domestic product (GDP) in 2007 US\$ prices or about 11.3% of the total annual GDP of all 20 CARICOM Countries (member states and associate member states) according to the World Bank estimates.

It is against this backdrop that the CARICOM heads declared, *inter alia*, to strengthen educational institutions to provide training, education, research and development programs in climate change and disaster risk management particularly in renewable and other forms of alternative energy, forestry, agriculture, tourism, health coastal zone management and water resource management to increase the regions' capacity to build resilience and adapt to climate change.

Regional initiatives to build capacity for climate change adaptation in the Caribbean commenced in the nineties. Overseen by the World Bank and CARICOM, the Adaptation to Climate Change in the Caribbean (ACCC) Project (2001-2004) was designed to sustain activities commenced earlier under the Caribbean Planning for Adaptation to Climate Change (CPACC) project.

The Adaptation to Climate Change in the Caribbean (ACCC) Project is mentioned here because the nine components of the project have a distinct similarity between its regional activities ten years ago, the national efforts under the PPCR here in Saint Vincent and the Grenadines today. Those components were as follows:

1. Project design and business plan development for a regional climate change centre;
2. Public education and outreach;
3. Integration of climate change into a physical planning process using a risk management approach to adaptation to climate change;
4. Strengthening of regional technical capacity, and partnerships including the association between Caribbean and South Pacific small island States;
5. Integration of adaptation planning in environmental assessments for national and regional development projects;
6. Implementation strategies for adaptation in the water sector;
7. Formulation of adaptation strategies to protect human health;
8. Adaptation strategies for agriculture and food; and
9. Fostering of collaboration/cooperation with non-CARICOM countries.

The outcomes of ACCC included the establishment of the financially self-sustainable Caribbean Community Climate Change Centre (CCCCC or the Five C's); a guide to assist environmental impact assessment (EIA) practitioners in CARICOM; a draft regional public education and outreach (PEO) strategy; and implementation of pilot projects on adaptation studies in the water health and agricultural sectors. During ACCC's tenure, negotiations took place for a third project, the Mainstreaming Adaptation to Climate Change (MACC) project.

3.3 Saint George's Declaration and the National Environmental Management Strategy

The Saint George's Declaration (SGD) of Principles for Environmental Sustainability in the OECS was signed by the OECS Ministers of the Environment in April 2001. The Declaration sets out the broad

framework to be pursued for environmental management in the OECS region. The SGD has 21 principles, and principle 8 aimed at addressing the causes and impacts of climate change.

Saint George's Declaration of Principles for Environmental Sustainability in the OECS³⁰ (revised 2006) has as its overall aim to foster equitable and sustainable improvement in the quality of life in the OECS region. There are four main goals: i) to build capacity for sustainable development; ii) involve a wide range of people in environmental management; iii) achieve long term protection of ecosystems, and iv) ensure natural resources contribute equitably to development.

The National Environment Management Strategy (NEMS) is the mechanism by which the SGD is implemented. The NEMS for Saint Vincent and the Grenadines contains two broad strategies (27 and 28) which give effect to principle 8 of the SGD. Strategy 27 speaks to establishing appropriate and relevant integrated strategies, plans and policies to adapt and respond adequately and in a timely fashion to the causes and impacts of climate change while Strategy 28 allows for collaboration at the regional and international levels, in the implementation of obligations under the United Nations Framework Convention on Climate Change.

Saint Vincent and the Grenadines is signatory to the Principles for Environmental Sustainability in the Organization of the Eastern Caribbean States (OECS) as are laid down in the Saint George's Declaration (SGD) of 2001. The 21 principles contained in the SGD place environmental management as a cornerstone of sustainable development, and OECS Member States have agreed to utilize these principles in the governance of national affairs. Most of these principles are directly relevant to the operations of many of the Ministries in Saint Vincent and the Grenadines. The development of a National Environmental Management Strategy and Action Plan (NEMS) is the mechanism for national expression of environmental programming in support of those sustainable development strategies.

The NEMS 2004 for Saint Vincent and the Grenadines was completed in 2004 through a process of district and sectoral consultations and after a review of key policies and programmes and feedback from a National Consultation on the draft NEMS. The overall process was coordinated by the then Environmental Services Unit (ESU), especially local publicity on the NEMS and community consultations, with inputs from the National Environmental Advisory Board. An update of the NEMS is currently underway.

3.4 National Economic and Social Development Plan

The National Economic and Social Development Plan (2011-2025) (NESDP) contains eight key elements: Culture, Identity and National Pride, Economic Sector Considerations, Social Capital, Governance, National Security, Energy, Disaster Management and the Environment, Physical Infrastructure, Education, Telecommunication, Science and Technology.

NESDP recognizes that the factors inhibit the global competitiveness of Saint Vincent and the Grenadines. The factors include: environmental/ecological vulnerability, particularly high exposure to natural hazards, hurricanes, storms and climate change and its attendant problems. These matters have been a major inhibiting factor in the economic growth and potential of Saint Vincent and the Grenadines. NESDP recognizes the need for a range of strategic inventions such as (1) development of a comprehensive system for sustainable land management, (2) development of land use policies and land area zoning plans (3) preservation of critical forests (4) a legislative framework to manage land use.

³⁰ Copyright © 2007 Organisation of Eastern Caribbean States Published by the Organisation of Eastern Caribbean States (OECS) The OECS Secretariat Morne Fortune PO Box 179 Castries St Lucia Telephone: (754) 452 2537 Fax: (754) 453 1628 Email: oesec@oecs.org Web site: www.oecs.org.

NESDP also identifies the need to enhance the capability of Saint Vincent and the Grenadines to effectively prepare for and mitigate disasters. This involves enhancing disaster preparedness and mitigation mechanisms as well as strengthening the national capacity to respond to, as well as mitigate disasters, enforcement of Building Codes, the development of a Disaster Emergency Management Plan, building resilience at the community level, the reduction in hazardous land occupancy, enhanced public health systems that can adequately respond to major emergency, and commitment to a comprehensive coastal management program that preserves natural buffers to climate compacts. The Project responds to many of these key issues. The three pilot projects will each address the building of community resilience at the community level. The PPCR also has a project for the preparation of a comprehensive disaster management plan. In addition, the three pilot projects will each seek to strengthen the requirements for ensuring compliance with the Building Code including setback requirements.

The development of a Coastal Zone Management Plan as well as strengthening the existing legal and institutional framework to prevent or reduce environmental degradation will result in the alignment of many aspects of the Project with the objectives of NESDP. The PPCR will also contribute to a number of key NESOP objectives. The improved data collection mechanisms will facilitate the development of a comprehensive plan for the sustainable management of land resources, as well as, the development of land use policies.

The NESDP addresses the using of a access to safe drinking water and focuses attention on a number of strategic interventions. This includes improving the protection and management of water resources and the development of water conservation quality of portable water. The PPCR does address a number of these issues. These include projects to assess and prepare management plans for fresh, portable and sustainable solution for the need of the Grenadines including rain water harvesting practices. The Plan will result in strengthen the implementation of NESDP as a result of following the guidance set out in NESDP. In addition, the Projects include the necessary investments for implementing aspects of the Plan.

There are some gaps in NESDP that are addressed in the PPCR in order to achieve effective implementation of climate change resilience in Saint Vincent and the Grenadines. Critical areas such as comprehensive coastal zone management, community based disaster risk management, gender sensitive approaches to disaster management, the protection of the marine environment, the control of sand mining and its impacts, the dire need for water in the Grenadines are not addressed in the NESDP. However, the PPCR does address all of these issues and some amendments to the NESDP will be needed to bring it in line with some of these critical issues facing SVG which will be increasingly become more important as part of the strategy for climate resilience. Given the urgency to revise, update and finalize the NESDP it will be necessary to secure project preparatory funding in support of a detailed revision and finalization of the Plan.

3.5 National Disaster Management Plan

The responsible agency for disaster management is the National Emergency Management Organization (NEMO). It is part of the National Security department in the Prime Minister's Office and employs a staff of 11, of whom three are professionals. The organization has developed a Disaster Management Plan for 2010-2012 that addresses all related topics on institutional objectives and action lines that fall under disaster risk management. The Plan was formulated and developed with technical assistance from the Caribbean Disaster Emergency Management Agency (CDEMA). Funding for operational aspects is channelled directly through the national budget. Currently, the focus is on addressing

recurring hazards such as forest fires, water shortages, etc. It also provides support to education projects aimed at training teachers in risk prevention.

The draft National Disaster Management Plan highlights priorities for disaster risk reduction and adaptation through assessment of climate change risk, public awareness, integrates strategy of combining structural and non-structural measures, modern communication facilities, strengthening emergency response systems, and international cooperation for overall disaster management, etc. This Plan needs to be amended to clearly integrate disaster management issues and climate change adaptation in all development plans, as well as community based programs for risk reduction and climate resilience programs and policies. Saint Vincent and the Grenadines.

The National Emergency and Disaster Management Risk Management Plan was established in 2005. This plan created a framework to cater for disaster preparedness and response. The plan however does not address the broad functions of disaster risk reduction in a holistic and systematic way. Nor does it contain adequate measures for adaptation to climate change.

In 2010, a process of drafting a new National Disaster Management Plan was commissioned by the Government of Saint Vincent and the Grenadines. The new draft National Disaster Risk Management Plan highlights priorities for disaster risk reduction and adaptation through assessment of climate change risk, public awareness, integrates strategy of combining structural and non-structural measures, modern communication facilities, strengthening emergency response systems, and international cooperation for overall disaster management, etc.

The Plan however needs to be varied to clearly integrate disaster management issues and climate change adaptation in all development plans, as well as community based programs for risk reduction and climate resilience programs and policies. Saint Vincent and the Grenadines, National Environmental Profile seeks the harmonization of plans with respect to waste management, pollution and climate change. It is also specifically calls for the establishing of appropriate and relevant integrated strategies, plans and policies to adopt and respond adequately and in a timely fashion to the causes and impact of climate change. It also calls for the establishment at the community and national levels, appropriate and relevant integrated frameworks to prevent, prepare for and respond to recover from, and mitigate the causes and impacts of natural phenomena on the environment and to prevent manmade disasters.

3.6 National Climate Change Adaptation Strategy

The draft National Climate Change Adaptation Strategy highlights the potential impacts of climate change on various sectors such as coastal and marine, agriculture and forestry, water resources, human settlement, socio-economic development, tourism and human health. It is also an attempt to integrate climate change concerns into the development plans of relevant sectors/ministries. Consequently, the appropriate adaptation measures may be taken to reduce the potential impacts of climate change and climate variability on Saint Vincent and the Grenadines.

This draft Strategy seeks to develop management strategies that address a range of key issues. These include increased public awareness to climate change issues, the reduction or avoidance of damage to settlements and infrastructure caused by climate change and sea level rise, minimizing damage to beach and shoreline integrity and marine ecosystems caused by climate change and the avoidance or minimization of negative impacts of climate change on human health. It also seeks to develop economic incentives to encourage investment in public and private sector adaptation measures.

It also provides a good basis for the discussions on the sectors that are vulnerable and the interventions that can be made to reduce vulnerability. Additionally, the NEMS has principle 8, which addresses the

causes and impacts of climate change and therefore the PPCR's projects will assist in the implementation of the strategies and activities associated with this principle. The PPCR and the National Climate Adaptation strategy have mutual objectives and the PPCR therefore fully supports the broad based implementation of the Policy. Finally, the Strategy seeks to develop an appropriate legislative and regulatory framework for proper environmental management and institutional systems for planning and responding to climate change.

The National Climate Change Adaptation Strategy is only a draft document and therefore not implemented and not monitored. As part of the PPCR process the draft will be reviewed, revised and finalized.

The three pilot projects of the PPCR will build climate resilience at the local and community level. The pilot projects will also assist in the operationalization of the Building Code and the reduction of hazardous land occupancy. Aspects of the pilot projects will seek to expand the water supply and distribution system particularly in the Grenadines. For example, the pilot project for Union Island will include among its objectives addressing water supply needs in Union Island.

The PPCR will also contribute to an improved national water management system and will also address the preparation of a coastal zone management plan. Generally the PPCR will provide support for enhanced and supportive legal and regulatory frameworks.

Despite the prognosis presented by climate change, St Vincent and the Grenadines has identified many opportunities to respond to the multiplicity of challenges poses by climate change. The National Climate Change Adaptation Policy identifies and groups many of these challenges and presented nominal solutions. In the matrix presented below, the challenges and nominal solutions within the National climate change Adaptation Policy are summarised with a new column added to shows synergies between the PPCR and the Government proposed plans to deal with some of the challenges outlined.

Sector	Impact	Adaptation Measures	PPRC Projects
Coastal and Marine Resources	Destruction of reefs, increased erosion of beaches, damage to low-lying and coastal areas, towns, roads and property infrastructure as a result of increased frequency, and intensity of hurricanes.	<ul style="list-style-type: none"> * Undertake Public awareness campaign to educate the population about the potential impact of climate change and climate variability on the coastal and marine environment. * Identify cost effective measures to protect and or reduce the damage to the coastal environment, including coastal infrastructure and coastal near shore ecosystems. 	1.1.4, 3.2, 3.5.3.6, 4.1, 4.1a, 4.8, 4.9., 4.12 All of comp. 2
Agriculture and Forestry	Reduced production and decrease in soil productivity as a result of less rain and drought.	<ul style="list-style-type: none"> * Undertake Public awareness campaign to educate the population about the potential impact of climate change and climate variability on Agriculture and Forestry. * Identify and adopt appropriate Methods of technology to facilitate the introduction of drought resistant crops. * Promote the maintenance of forested and green areas as a buffer to the negative effects of climate change. 	1.1.4, 1.2.4, 1.3.1 4.11,
Water Resources	Negative impact on the generation of hydroelectricity and potable water as a result of	* Undertake comprehensive inventory of all water resources including surface and ground water.	1.2.4, 1.3.1, 1.1.4.

	deforestation, landslides and increased soil erosion.	* Identify cost effective methods to increase water recovery.	2.1, 2.2, 2.3
Human Settlement	Impact on settlement patterns and building design.	* Develop a comprehensive land use planning and management plan * Develop a disaster management plan	1.3.2, All of comp, 2 3.2, 3.4, 3.7
Socio/Economic Development	Increased costs to the financial sector including the banking and insurance sector.	* Facilitate the availability of cost effective insurance and reinsurance to aid affected areas, in order to rebuild and restore infrastructure. * Adopt "risk management" techniques as a tool that can be applied in the design and selection of strategies for coping with uncertain climate change.	1.1.2, 1.1.1, 1.3.3, All of component 2
Tourism	Damage to tourism infrastructure located in coastal areas and coastal ecosystems such as coral reefs, as a result of storm surges.	* Undertake public awareness campaign to sensitize individuals about the potential impact of climate change and climate variability on Tourism. * Adopt appropriate technologies and develop policies to promote water conservation, the use of renewable energy and the management of both solid and liquid wastes in the Tourism Industry.	4.1 All of component 2 1.1.2, 1.2.6, 1.1
Human Health	* Increased incidence of heat stress and related injuries. * Increase in vector and water borne diseases as a result of increased temperature and precipitation.	Undertake public education and training programme to increase awareness about the potential impact of climate change and climate variability on health.	4.1

Figure 23: Impacts, Adaptation Measures and Proposed SPCR Initiatives.

All of the recommendations³¹ below (from the National climate change Adaptation Policy) were used to develop detailed projects to fill the identified gaps. The Adaptation Policy prescribed the following:

...to address the impacts of climate change on Social/Economic Development the Government of Saint Vincent and the Grenadines through the relevant ministries will:

1. *Undertake a Public Education and Training Programme to increase awareness of individuals and the general public on issues relating to climate change and Social And Economic Development of Saint Vincent and the Grenadines.*
2. *Enforce proper building design and building codes, zoning and land use planning legislation to reduce the damage to infrastructure during climatic events such as hurricanes.*
3. *Facilitate the availability of cost effective insurance and reinsurance to aid affected areas in the rebuilding and restoration of infrastructure³².*

³¹ This was done as part of a project and it can be considered as what has been attempted before with regards to mainstreaming climate change in SVG. This plan along with the NESDP are examples of where mainstreaming has occurred.

³² Draft Climate Adaptation Policy, Environmental Unit, Ministry of Health and Environment, 2002.

3.7 Disaster Vulnerability Reduction Project Summary (DVRP)

Developed during 2010 and finalized in February 2011, the DVRP is a World Bank funded regional program with national projects in Grenada, Saint Lucia and Saint Vincent and the Grenadines. By design, the project in Saint Vincent and the Grenadines will be financed by both direct funds from the CIF as well as co-financing from other sources (i.e. IDA and GFDRR). The CIF funding will support climate change adaptation activities, while the co-financed portions will primarily focus on current disaster risk management needs – but will support overall resilience to adverse natural events which are expected to be more extreme with climate change. In order to achieve this, the project proposes two mutually reinforcing components, namely: 1) Prevention and Adaptation Investments; and 2) Capacity Building for Hazard and Risk Evaluation, and Applications for Improved Decision Making.

While there are separate financing mechanisms for the DVRP (IDA) and the PPCR (CIF), there are clear commonalities between the PPCR and the DVRP. There are also clear distinctions between the objectives and projected outcomes. The projects are complementary and have therefore been combined and brought forward as a single package. The DVRP has a greater emphasis on physical works. The PPCR has a broader approach, looking more comprehensively at the causes of vulnerability, the need for awareness and knowledge management, the impacts of climate change on business and communities and the need for strengthened policy and institutions.

The proposed investment plan for the Saint Vincent and the Grenadines DVRP has been developed through a consultative process with a number of agencies and departments, including the Ministries of Health, Education, Agriculture, the Meteorological Office, Transport and Works, Housing, Physical Planning, Land and Surveys and NEMO.

The process commenced in February of 2010 with presentation of the project objectives to these agencies and an invitation to submit activities that could potentially be financed under the Project. The aim at this point was to secure from the agencies as large an investment plan as possible, consisting of enough activities that could be appraised and possibly proposed to funding agencies including the World Bank. These activities were prioritized at the agency level and then further prioritized at the national level by the Ministry of Finance and Economic Planning in line with the overall developmental objectives. This reprioritized list was then submitted to the World Bank in July 2010. Following this, the process of further developing the activities in terms of the estimated cost and defining the work to be undertaken commenced. Several follow up meetings were held with the agencies and many of the proposed sites were visited.

As part of the project preparation requirement an Environmental Assessment (EA) was undertaken. The EA was completed and findings were published on the Government's official website in February 2011. In addition, work is ongoing on a Social Assessment and Resettlement Policy Framework for the Project.

In October 2010 during the preparation stage, Saint Vincent and the Grenadines was hit by hurricane Tomas and some of the activities to be addressed under the DVRP were further damaged by this storm. Accordingly, the Government moved to prepared an Emergency Recovery Project for submission to the World Bank, which was approved in January 2011.

Project Objective

The DVRP aims at measurably reducing vulnerability to natural hazards and the adverse impacts of climate change in Saint Vincent and the Grenadines.

Major Outcomes Expected from the Project: The major outcomes expected from the project include: (i) Capacity built to identify and monitor climate risk at the national level; (ii) Reduced vulnerability of

public infrastructure and emergency communications: (iii) Strengthened emergency management capacity and improved effectiveness of risk reduction investments; and (iv) Strengthened institutional capacity for disaster risk management.

Project Components

Component 1 - Prevention and Adaptation Investments. This component would include a broad set of investments, such as drainage improvement measures, improved water storage capacity, risk reduction, rehabilitation of critical infrastructure (ports, bridges, and some roads), retrofitting of critical public buildings (including schools and health centers), investments in satellite emergency centers, etc. Civil works would be built to internationally recognized standards for hazard and climate resilience.

Projects activities would fund supporting studies required for the development of works packages such as hydrologic/hydraulic studies, geotechnical studies, and associated pre-engineering and engineering supervision activities required to support engineering design and safeguard compliance.

Component 2 - Capacity Building for Hazard and Risk Evaluation, and Applications for Improved Decision Making. The project would support the strengthening of national capacity to integrate natural hazard and climate change impact information into the national development policies and the decision-making process.

Under this component, two technical assistance projects supporting the integration of climate risk information in decision making would be piloted. This would be done through building open-source models for risk evaluation and capacity at the regional level to work with such models. The methodology used would allow for a horizontal transfer of experiences among the participating countries. The program would build on data and models generated by the Caribbean Catastrophe Risk Insurance Facility (CCRIF), models generated by the Central American Probabilistic Risk Assessment (CAPRA) initiative, and complement current work financed through a GFDRR grant to build capacity for risk evaluation at the University of the West Indies.

The project would finance a national level data collection of geo-spatial data using an aerial platform with multiple instruments for the data collection of detailed bathymetry, topography, and hyper-spectral information. It would also support the capture of existing geo-spatial data currently spread among national institutions in the participating countries. The program may also finance procurement of data collection equipment and instruments as well as computers, servers, and software as needed.

To improve data management and sharing capacity activities would include the transfer and capacity building in use of open-source software for geospatial information (GeoNode) to at least one national institution. This software would also be installed at a selected number of regional technical agencies (initially the following three regional technical agencies have expressed interest: the OECS Secretariat, the Disaster Risk Reduction Center at the University of the West Indies, and the Caribbean Community Climate Change Center) to facilitate the collaboration on data between countries and regional technical agencies.

Component 3 - Emergency Response Contingent Credit. Following an adverse natural event, or immediately before the occurrence of an adverse natural event, and subject to a Government's declaration of a national emergency in accordance with national law, a Government may request the World Bank to re-categorize financing or add contingent financing to cover early recovery and rehabilitation costs.

This component could disburse to cover any or all of the following sub-components:

- (i) Purchase of goods, works, and consultant services (including audit costs) for emergency response and recovery; and
- (ii) Cash support for the respective Ministries of Finance, by disbursing against a positive list of imported and locally-manufactured goods (up to US\$2 million).

Component 4 - Project Management and Implementation Support. Activities under this component relate to the institutional support and capacity development for project management and implementation. Activities include training, staffing, and development activities associated with project execution, such as consulting services and support for:

- (a) Preparation of designs and tender documents for execution and supervision of works, purchase of goods, and contracting of training activities;
- (b) Preparation of project reporting;
- (c) Processing of contracts including the evaluation of tenders, preparation of evaluation reports, selection of contractors, and negotiation and supervision of contracts;
- (d) Liaising activities among the participating line ministries during project execution;
- (e) Supervision of the quality of works;
- (f) Specific training of staff in project management and execution; and
- (g) Capacity building for accreditation from the UNFCCC Climate Adaptation Fund.

3.8 Draft Water Policy

The Draft Water Policy has been framed to guide the Government of Saint Vincent and the Grenadines in management of the country's inland waters. It is based on the recognition that water is a precious natural resource and heritage, vital to all aspects of social, economic and environmental well-being.

The purpose of this water policy recommendation is to ensure the use of water resources in an effective and equitable manner, consistent with the social, economic and environmental needs of present and future generations.

The recommendations adopt an "integrated" approach, which recognizes natural linkages. Emphasis is placed on water resource management considering the river basin as the fundamental unit, involving both upstream and downstream water users, government and other stakeholders. Surface and groundwater are seen as two forms of the same resource, often with close linkages. Water quality and quantity are also linked features and should be planned and managed in a coordinated manner.

The Policy is also "comprehensive" in terms of water-using sectors; it addresses water resources from a broad, multi-sector perspective while recognizing the responsibility of those sectors to play their part in meeting the Policy's objectives. The Policy considers consumptive water uses, such as irrigation, domestic and industrial, and non-consumptive uses, such as hydropower, recreation and amenity. It also brings the environmental and ecological needs for water to the forefront.

3.9 Linkages with other National Legislative Instruments

The key focus of climate change response in Saint Vincent and the Grenadines is building resilience or the ability to cope. Central to this task is the issue of governance, which involves a number of key considerations including an effective legal and institutional framework in order to facilitate accountability, enhanced systems for coordination, capacity building and monitoring; integrating vulnerability information and mitigation into development planning, administrative management, decision making in the public and private sectors.

In order to effectively implement climate change resilience strategies, there will have to be a number of changes to the existing policies or the preparations of new policies. Saint Vincent and the Grenadines has several statutes, which address disaster management, coastal zone issues, environmental protection and physical planning. These include the Town and Country Planning Act, National Parks Act, Waste Management Act, Forest Resource Conservation Act, Fisheries Act, Beach Protection Act, the Central Water and Sewage Authority Act, the Environmental Health Services Act, National Emergency and Disaster Management Act and the National Parks Act. However, many of these statutes are outdated or need revision and therefore the development of a strategic program for climate resilience will require a comprehensive review of existing Legislation as well as new regulations, new legislation and amendments to the existing statutes.

In addition, legislative changes will be needed in a number of key priority sectors e.g. environment, coastal zone management, water, development planning, disaster planning and resource management. Institutional strengthening will also be necessary for key ministries and agencies such as NEMO, Ministry of Finance, Ministry of Works, Physical Planning, National Parks, River and Beaches Authority.

There are some major gaps in the legislative framework these include an Environmental Management Act (though one exists in draft and could be revised where necessary and enacted), Environmental Impact Assessment Regulations and a Coastal Zone Management Plan. Although the Town and Country Planning Act refers to a coastal zone management plan no such plan has been promulgated neither are there any statutory provision for developing such a plan. This issue is of central importance to Saint Vincent and the Grenadines as more than 90% of its infrastructural development lies on a narrow coastal belt less than eight meters above sea level. These include the island's main communication and response structures – roads, airports, telecommunication centres, financial centres and technical support centres. A major focus of the PPCR is the collection of data related to the coastal zone, the preparation of a coastal zone management policy and plan and strengthening the Town and Country Planning Act in relation to the declaration of a Coastal Zone Management Plan.

3.10 Collectively Managing Forests

The Forestry Department is responsible for the Protection, Conservation and Development of the Forest resources of Saint Vincent and the Grenadines which covers all the watersheds. Which are critical for the production and sustainability of the water supply? Numerous ongoing activities are implemented within each of the following program areas.

- Plantation Management
- Forest Mapping and Inventory
- Forest Utilization
- Law Enforcement & Compliance
- Environmental Education
- Wildlife Management
- Ecological Research
- Watershed Management
- Nursery management

Forest and woodlands cover around one third of the land area of Saint Vincent and the Grenadines. A changing climate generates an autonomous change in forest ecosystems. Given the extent of deforestation and the subsequent negative impacts on water supply and environmental quality, there exists an urgent need to sustain and enhance the contribution of forest resources to social and economic development.

The Government of Saint Vincent and the Grenadines through the Ministry of Agriculture, Forestry and Fisheries has developed a programme called the Integrated Forest Management and Development Programme. The Programme incorporates all stakeholders, from resource management agencies (governmental and non-governmental) to individual communities. The aim is to protect forest resources and enhance rural livelihoods by reducing poverty. This will require both adaptation measures and building resilience in the community.

The Programme Management Unit (est. 2003) had a mandate to develop conservation efforts for identified critical watersheds, develop projects for funding and develop public education initiatives. The PMU is funded by financial contributions from VINLEC, CWSA and the Government's capital programme. There have been successful efforts in the reforestation of critical watershed areas.

The alternative livelihoods component has maintained a continual process of working with rural farmers and forest users to develop viable alternatives to alleviate poverty and prevent deforestation for the cultivation of illegal crops such as marijuana.

The following points summarise relevant projects and initiatives in the forestry and watershed management sectors in Saint Vincent and the Grenadines over recent years. The SPCR proposed investment projects build on these initiatives to make best use of these resources:

- Started in the 1960s with the establishment of large Blue Mahoe (*Hibiscus elatus*) and Caribbean Pine (*Pinus caribea*) plantations around immediate Catchment areas. The objective here was to reforest denuded areas with a fast growing species for soil and water conservation purposes.
- This was followed by the reforestation of smallholdings disturbed by squatters and reclaimed by Forestry. The objective here was to maintain the integrity of the forest above the 1000' contour which Forestry is mandated to protect.
- In 1987 the Organization of Eastern Caribbean States Natural Resources management Unit (OECS/NRMU) conducted a socio economic study of the Montreal watershed. See Document for objectives.
- In 1990 the Canadian International Development Agency (CIDA) conducted a pilot project in the Colonarie watershed introducing a new methodology where several surveys/studies were carried out leading up to the development of a comprehensive watershed management plan. The objective was to demonstrate sound watershed management principles to neighbouring farmers and to transfer technologies and methodologies to other watersheds around the island.
- In 1990 CIDA also surveyed the forest reserve boundaries in the Montreal watershed as part of an island wide survey. Objective: The FRCA requires the Director to demarcate the forest resources managed by the Department.
- Under the same CIDA project (1989-1999) a special reforestation plan was done for Montreal where the Forestry Department was mandated to reforest 48 acres of land around immediate catchment areas. The objective was to protect the water catchment by conserving the soil and the Forest.
- June 1999 the OECS/NRMU made a second intervention in the Montreal watershed for the implementation of a pilot project. The objective was to test a sustainable watershed management plan that was similar to another plan that was simultaneously being implemented in St. Lucia. The focus was on the adaptation of an integrated approach to watershed management.
- In 2000-2003 the department continues its routine reforestation and land reclamation initiatives utilizing recurrent government Funds. The objective was soil and water conservation.
- In August 2004 to May 2005 the Forestry department through Funding from the Integrated Forest Management and Development Project reforested 95 % of lands in the upper Montreal

watershed occupied by squatters. The objective was to reverse the current trend of land degradation and water quality deterioration.

- In 2006, proposed National Capacity Building Strategy for Saint Vincent. This strategy is a response to the need to build the capacity of stakeholders for participatory policy analysis, policy formulation and forest management through effective training, technical assistance, and regional and cross sectoral dialogue. The overall goal of the project is to promote effective Sustainable Land Management in Saint Vincent and the Grenadines.
- Policy on protected areas systems for Saint Vincent and the Grenadines
- Saint Vincent and the Grenadines environmental management act 2008
- Environmental Watershed project to facilitate Forest based Livelihood Opportunities 2008.
- Capacity building and mainstreaming of Sustainable land management in Saint Vincent and the Grenadines. The focus is on; Historical perspective on Land management in Saint Vincent and the Grenadines, Current land degradation issues, land tenure, Regional and international conventions (signatory), and Legislative Instruments relevant to Saint Vincent and the Grenadines.
- Draft forest regulations for FRCA No. 42 of 1992. The objective is to strengthen the FRCA.
- Integrating Watershed and Coastal areas management in Caribbean Small island developing states (IWACAM) 2005-2010.
- National Biodiversity Action plan
- Integrated Forest Management and Development Programme. The main focus of this programme is to provide alternative livelihood opportunities for forest users and to build the capacity of the Forestry department.

3.11 Sustainable Land Management Project

The Sustainable Land Management Project (a separate project currently underway within the Ministry of Health and Environment) should be highlighted here as well given the activities of the project and the fact that the PPCR is taking a watershed management approach. There will be opportunities for synergies to be identified between both projects.

The objective of the SLM project is to “strengthen and develop capacities for sustainable land management in relevant government ministries, the private sector, and civil society organizations, and to mainstream sustainable land management into national development planning”.

The project has five outcomes including:

1. Sustainable Land Management is mainstreamed into national development policies, plans and regulatory frameworks (inclusive of completion and ratification of the National Action Plan);
2. Individual and institutional capacities for SLM are developed;
3. Capacities for knowledge management in support of SLM are developed;
4. Investment planning and resource mobilization for implementation of SLM interventions are elaborated; and
5. Adaptive Management and Learning.

The three-year project is being implemented by the Environmental Management Department in the Ministry of Health and the Environment using a multi-stakeholder participatory approach involving public, private and non-governmental organizations. There will be considerable opportunities for SPCR projects to collaborate and support this existing project.

3.12 Gaps Identified in Water and Watershed Management

Some of the activities mentioned under the present initiatives are at varying stages of implementation while other has been implemented but not successfully due to certain limitations. It is therefore in light of these scenarios that the following gaps or propose activities are identified for possible action/further implementation. For the purpose of this document references will be made to specific project documents, particular attention should me paid to the objectives and achievements/variances.

- ✚ Under the national Water Resources management Study for Saint Vincent and the Grenadines, one will realize that due to financial and time constraints, some significant proposed activities have not been implemented. Revisiting the proposed deliverables for this project with an intention to finish such will definitely put Saint Vincent and the Grenadines in a position to better assess its water resources. (Outstanding: Rain gauges, Climate stations, water resources management Agency, data collection team, Vehicles, and water resources management policy, to name a few.)
- ✚ Quantity and quality of water resources not well known (need to launch an adequate hydro-meteorological monitoring network)
- ✚ Existing water resources are not adequately protected.
 - Need to ensure secured access by Officers to the resources (source and implement the appropriate training and equipment)
 - Need proper signage and demarcation of protected areas (Resource Inventory and Mapping)
 - Proper monitoring and policing (increase human, material and financial resources)
- ✚ Continued degradation of upper watersheds. What is needed hers is the continued sensitization of the populace along with several mitigating initiatives focusing on soil and water conservation and natural forest management. Management plans for selected affected areas is needed.
- ✚ Water Pollution. In the upper echelon of the watersheds this is caused mainly by the indiscriminate use of biocides for legal and illegal farming. Proper law enforcement is necessary and also capacity building to this effect
- ✚ Institutional weakness
 - Institutional strengthening
- ✚ Lack of a comprehensive water resources management policy, and the legal and organizational framework is somewhat fragmented.
 - With such a policy in place the Forestry Department will be guided accordingly and the relevant resources and collaborators brought on board having being mandated to do.
- ✚ Adequate supply/water shortage persistent in the Grenadines.
 - Rain water harvesting project be instituted
 - Continue the implementation of recommendations/work identified for the Grenadines in the National Water resources management Project.
- ✚ Review and strengthen the resources of the Forestry Department to adequately address the protection of water resources in Forest Reserves.
 - Most of the program areas within the Department are managed by non professionals; persons need to be trained at least to a professional level to effectively deal with the challenges/task set before them.
- ✚ Conservation of wetlands (Low priority at the moment). In Saint Vincent and the Grenadines wetlands are disappearing at an alarming rate and the remaining wet lands are given little or no attention. Wetlands need to be seen by the relevant resource managers as a priority. This would require knowledge about wetlands and specialist training.

- ✚ Saint Georges declaration of principles for environmental sustainability in the OECS
 - These principles address the causes and impacts of climate change.
- ✚ Proposed National capacity-Building strategy for Saint Vincent and the Grenadines (June 2006)
 - Capacity needs assessment and suggested possible recommendations. The recommendations should be revisited and implemented where applicable.
- ✚ Policy on protected areas systems for Saint Vincent and the Grenadines
- ✚ Saint Vincent and the Grenadines environmental management Act 2008
- ✚ Environmental Watershed Project to facilitate Forest based Livelihood Opportunities 2008. This project has a similar focus as the I.F.M.D.P., however it was not properly or even implemented. It is recommended that this project document be revisited and a way forward be chartered.
- ✚ A Law enforcement manual has been developed by Forestry officer III Bradford Latham, this document needs to be reviewed by a professional and adopted by the department for further endorsement by the authorities.
- ✚ The Forest Resources Conservation Act No. 47 of 1992 need to be enacted. This has legal implication for Officers who is currently authorize to perform duties under this act.
- ✚ The process for the passing of the Draft forest regulations of February 1994 which is needed to strengthen the FRCA of 1992 needs to be completed.

4. Rationale for PPCR Support

4.1 Added Value

Where can PPCR program add value? The PPCR will contribute to and facilitate improvements in the following areas:

- Enhancement of physical infrastructure
- Enhancement of natural ecosystems
- Enhancement of regulatory and legislative tools
- Knowledge management and a more informed populace
- Coastal protection
- Strong pilots that can test larger development plans
- finalization of national policies and plans
- strengthen legislative and regulatory frameworks
- increase capacity to produce, manage and utilize data
- Preservation and creation of livelihoods increasing the social and economic capital of the country.

4.2 Climate Resilience Priorities

What are country main priorities towards climate resilience? The country's main priorities towards climate resilience building are summed up in the National Climate Change Adaption Policy and the National Economic and Social Development Plan and the 1st and 2nd National Climate Change Communication Projects. The four components of PPCR were in fact formulated as a summary of the Government' priorities for climate change resilience building. The main priorities of the Government of Saint Vincent and the Grenadines on climate change resilience building are:

- 1) conducting country wide vulnerability and risk assessments on climate change;

- 2) develop and implement reduction and adaptation programmes aimed at reducing vulnerability and building resilience;
- 3) strengthening of existing policy, legal and institutional framework to address Climate Change;
- 4) design and implement a national public education and capacity building programme to inform and guide the populace with targeted pitch to specifically identified groups;
- 5) develop a national data management system to support climate change;
- 6) develop national capacities to formulate, implement and sustain where possible climate change resilience building.

4.3 PPCR Support Needed

What and why is PPCR support requested? The science on climate variability and change clearly predicts that the adverse effects that small island developing states (SIDS) like St Vincent and the Grenadines are likely to result in more displacement of human population, loss of life and livelihood, destruction to ecosystems, the environment as a whole and to our built infrastructure. If left unchecked, our way of life, our economies and our social capital is likely to be eroded, in the process, setting back development gains by decades. Our children's legacy will be in jeopardy.

Our people and our policy and decision makers all recognize that actions need to be taken to stem the tide and to adapt where there are no other recourses. And though the interventions of some local, regional and international organizations towards adaption are commendable, the efforts are for the most part piece-meal and unsustainable. There is an urgent need to be properly coordinated and fund a national programme aimed at building resilience for climate change in all sectors and for all our people. The PPCR is a systematic and coordinated proposal by the Government of St Vincent and the Grenadines to develop and implement a national programme that satisfies the needs identified above.

4.4 Climate Resilience Scaled-up

How does this support a shift in approach to development planning and scaled-up action towards climate resilience? This project is intended to change what can be capsule as "business as usual" regarding the way that development planning is done in Saint Vincent and the Grenadines. Component 2 is a data management capacity building module that will create the enabling environment for data management and analysis that will improve development planning. The added value is that the approach relies on the input of a multiplicity of agencies in both the private and public sectors in whom significant investments will be made improve capacity to develop and generate necessary data sets and to manage, process and analysis data pertinent to the processes necessary for building resilience to climate change. This project will result in a more informed community (businesses and residents) who will be better able to communicate their views, needs and proposals to the development planners.

4.5 Value for money – Investing in People

What is the potential cost effectiveness of proposed actions? Close examination of the PPRC proposals will revile that over 60% of the proposed budget will cater for institutional capacity strengthening and public awareness. This is a huge investment in the development of the people, institutions and governance mechanism of the country. The old adage of '*teach a man to fish*' is apt in explaining what the PPCR will achieve for St Vincent and the Grenadines. Such an investment in the development of the capacity of people, complimented by a strong and well-targeted public education and awareness programme on building awareness for climate change resilience building, must outweigh the dollar value of the investment.

4.6 Owned Driven and Sustained by Saint Vincent and the Grenadines

How is it sustainable? This SPCR has been prepared to ensure the long-term sustainability of these initiatives using the working tools described below. Building knowledge and understanding, providing extensive learning opportunities and increasing awareness of citizens, business and Government is at the core of this strategy. Taking a holistic approach is what will make it happen. A strengthened policy for example (revised Legislation) is of little value without the contingent training on its use, application and enforcement, or without the requisite skills in Government institutions to maintain and follow its guidance. In short, good design of policies and programmes is a firm basis for transformational change.

- 1) It was developed through widespread consultation with stakeholders throughout St Vincent and the Grenadines. The program was made by the people, and tailored to their needs. The people therefore own the program; country driven and country led. The Consultant Team has merely facilitated and communicated these identified and real priorities.
- 2) The program offers real and tangible solutions to many of the problems that the country faces. The program will be implemented by agencies within the country. This will ensure that there will be significant investments in the capacity of the people to make deliveries as planned.
- 3) The PPRC is an attractive program in which many other donors will make investments.
- 4) There is political will on the part of government and by the people to be involved in the development and implementation of this program.

5. Institutional Analysis

5.1 Structure and Functions of Government

St Vincent and the Grenadines has a Parliamentary Democracy based on the Westminster model and has remained part of the Commonwealth of Nations. There are three branches of Government: Executive, Legislative and Judicial. The legal system is based on English common law.

The Executive branch of Government makes policies, implements laws and governs the country. The Legislative branch of Government enacts laws and regulations. The Judicial branch makes legal decisions including interpreting laws as well as the constitution. Cabinet is the decision making body for Government and makes policy decisions based on submission from the various Ministries. There is a quasi-system of local government with non-elected town boards in all towns in St Vincent. The Government is in the process of reforming the local government structures.

5.2 Institutional Structure for Managing Climate Change Adaptation and Disasters

In Saint Vincent and the Grenadines, all key development sectors are impacted by the increased frequency of climate related hazards. Different ministries, line agencies, research organizations, academic institutions and NGOs play major roles in various activities related to adaptation to climate change. These roles are summarized in the following table.

Name of Institution	Roles and Responsibilities in Climate Change Adaptation and Climate Induced Disaster Management
Ministry of Health, Wellness and the Environment	Oversight of environmental issues, secretariat for multilateral environmental agreement, secretariat for climate change convention, implement climate change projects, policy advocacy, awareness campaign and international negotiation. Climate Change Focal Unit

	and coordinated Climate Change Cells located at relevant ministries and line agencies; responsible for complying with decisions under the UNFCCC and Kyoto Protocol including preparation of national communication, administering climate funds attending international negotiations, mainstreaming climate change at national and sector levels. Advocate adaptive public health intervention and monitoring communicable diseases.
Ministry of Transport, Works, Urban Development and Local Government	Coastal defences, shoreline protection, road construction and rehabilitation.
Ministry of National Mobilisation, Social Development, The Family, Gender Affairs, Persons with Disabilities, Youth, Sports and Culture	Work on the unprivileged sector of the society. Implement programs for disadvantages and vulnerable communities.
Physical Planning Unit	Planning approvals, building approvals, setbacks
Central Water and Sewerage Authority	Nation-wide water resource planning and management. Monitoring water resources. Key player in addressing water related vulnerabilities. Supplies Saint Vincent and the Grenadines with water and is responsible for sewage treatment and solid waste management.
Department of Forestry	Implementation of community based adaptation measures through coastal reforestation. Raising greenbelt/reforestation along the coast. Create forest biomass carbon inventory and develop forest based CDM projects.
NEMO	<p>Coordinate activities related to disaster management from national to grass roots level. Formulation and implementation of Disaster Management Plan and focal point for CEDERA, provide support to disaster management decision makers, planners and practitioners in disaster preparedness, local level disaster contingency planning, awareness training, facilitating improved information collection.</p> <p>Responsible for pre- and post disaster rehabilitation. Formulation and implementation of Disaster Management Plan and related activities. Arrange meetings of the National Disaster Management Council to assess disaster preparedness of different Ministries, agencies, departments, local governments, CPP, Red Crescent, NGOs, etc.</p>
Ministry of Agriculture	Dissemination of climate resilient crop variety, promotion and extension of adaptive agriculture to farmers. Carries out research on adaptive agriculture.
Department of Fisheries	Carry out research on adaptive aquaculture. Monitor fish sanctuaries and coastal activities.
Environmental Health Services	Provision of drinking water supply, sanitation and waste management and advisory service in framing policy and action plans for water and sanitation.
Meteorological Department	<p>Monitor surface and upper air layers, provide weather forecasts for public, farmers, mariners and aviators, and issue warnings for severe weather phenomena. Exchange meteorological data, forecasts and warnings, and archive and publish climate data. Prepare special weather bulletins and publicize through news media such as radio, television and newspapers.</p> <p>Provides information for aviation services.</p>
Ministry of Finance and Economic Planning	<p>Mobilize external resources for socio-economic development. Interfacing with development partners, coordinating all external assistance inflows into the country. Assess needs for external assistance inflows into the country. Assess needs for external assistance, devise strategy for mobilizing foreign assistance, signing of loan and grant agreements.</p> <p>Facilitate overall planning. Support sector planning and provide guidance to sector ministries.</p>
VINLEC	Responsible for supply of electricity in Saint Vincent and the Grenadines. Assess impact of rainfall variability on hydro dams.

National Trust	NGO involvement in environmental issues
JEMS	NGO involvement in community activities
Telecommunication Companies	Private sector companies such as LIME and Digicel are integral to disaster response and to an early warning system

Figure 24: Roles and Responsibilities in Climate Change Adaptation and Climate Induced Disaster Management

The preparation of a National Environmental Management Strategy and Action Plan (NEMS) for St Vincent and the Grenadines is a requirement of the Government in discharge of its obligations under the St George's Declaration (SGD) of Principles for Environmental Sustainability in the OECS, 2001. There are 21 Principles that have been prescribed in the SGD, and OECS Member States have agreed to utilize these in the governance of national affairs. Most of these Principles are directly relevant to the operations of many of the Ministries in St Vincent and the Grenadines, and these Ministries can best ensure that strategies and actions are utilized to uphold these Principles³³.

Other Agencies and Statutory Authorities

CENTRAL WATER & SEWERAGE AUTHORITY

The CWSA is a statutory organization responsible for the collection, treatment and distribution of water for domestic and industrial use. This institution is also responsible for solid waste management.

SAINT VINCENT ELECTRICITY SERVICES LTD.

The solitary electricity provider has three hydro-electricity plants. These stations are in Richmond, Cumberland and South Rivers and generate an average of 30.7% of power per annum.

NATIONAL IRRIGATION AUTHORITY

A national Irrigation programme implemented under the Ministry of Agriculture and the CWSA preceded this authority, which was established by recent legislation. This authority functions to manage the collection, control and distribution of irrigation water.

NATIONAL PARKS, RIVERS AND BEACHES AUTHORITY

This authority is responsible for developing and managing recreational sites, terrestrial and marine ecosystems of recreational and conservation value.

LOCAL MANAGEMENT INITIATIVES

There are several local projects geared at better managing of the natural resources including the watersheds and water resources.

- The Integrated Forest Management and development programme
- The national water resources management study
- Sustainable watershed livelihood project

5.3 Strengthening Institutional Capacity

The PPCR seeks to provide institutional strengthening for key government agencies involved with climate change. The Ministry of Health, Wellness and the Environment, Ministry of Works, Physical Planning Unit, national Parks Authority, Fisheries Department, Forestry Department, Ministry of

³³ National Environmental Management Strategy and Action Plan (NEMS) for St Vincent and the Grenadines – 2004-2006, Floyd Homer and David Shim, CIDA, 2004, p.4.

Finance, Central Water and Sewage Authority. The Met Office and NEMO will all benefit from the improvement of their in house capabilities.

The objective of the PPCR institutional support would be to mainstream climate resilience in all aspects of the Government and also to improve the technical capacity of key government institutions to include climate resilience into their policies and operational plans. The PPCR also seeks to build bridges between the Government and the private sector and also to raise the awareness of members of the public.

Given the approach to development adopted under the PPCR special capacity building programs tailored to climate resilience have been designed for implementation. These capacity building programs should aim at enhanced awareness of climate change and its implications, adaptation and mitigation options, need for change of approach for pooling resources, integrating development strategies with programs that address climate change, and promulgation of policies. This requires a comprehensive assessment that includes both the institutional structures, cross sector linkages and coordination/collaboration mechanisms, vertical and horizontal integration, functions and enforcement capabilities, gaps in the generation and dissemination of knowledge products will identify the capacity constraints that must be addressed to mainstream climate change adaptation in development policies and planning.

Climate change has implications for many economic sectors. Integrating climate issues into other aspects of development work (by mainstreaming them into strategies for growth and poverty reduction) and defining a common agenda for action will require investments in research and knowledge generation specific to the problems of Saint Vincent and the Grenadines, together with institutional strengthening and financing – all within a coherent framework.

As indicated in various policies and plans (e.g. NESDP and the Draft Climate Change Adaption Strategy) Saint Vincent and the Grenadines recognizes the need for capacity building, with enhanced awareness of climate change as an integral element to address the challenges that constrain effective implementation of the agreed policies and strategies for mainstreaming climate change in the nation's development agenda. The PPCR contains a range of capacity building programs that recognize the need for change in the mindset of decision makers for mainstreaming climate change in the development policies and strategies. These are needed if transformational change is to occur. In addition both Component 3 and 4 supports climate change adaptation oriented policy reform and institutional and legal strengthening as part of capacity building.

5.4 Private Sector and Climate Change

For the effective implementation of climate resilience it is of critical importance that private investors, governments work to overcome the barriers that restrict climate change, mitigation and adaptation.

The susceptibility to the physical effects of climate change varies considerably across sectors of the economy. For example, higher demands for electricity during periods of prolonged heat waves could stress and potentially overwhelm the electricity grid and have a major impact on VINLEC. More intense rains could restrict access to construction sites and affect productivity in the building sector. The agricultural sector is at risk where there is long or extreme drought. While some sectors are more at risk, all businesses face the possibility of property damage, business interruption and changes or delays in services provided by VINLEC and CWSA as well as impacts on construction infrastructure.

In Saint Vincent and the Grenadines an examination of the relationship of the private sector and climate resilience has not been undertaken in depth, though initial discussions have been held with selected businesses. These initial discussions clearly demonstrate that the private sector has a major

role to play in climate resilience. This matter should therefore be pursued in the early stages of the implementation of the PPCR. However Project 3.5 addresses the need to raise awareness among both government and the private sector. In addition Project 4. 10 seeks to establish collaborative mechanisms between government and the private sector. There are various areas of the private sector, which would be of particular importance for climate resilience. These include insurance, shipping, transport and the tourism industry.

6. Outline of the Strategic Program for Climate Resilience

6.1 Summary of Actions

The framework of actions designed for advancing climate resilience in Saint Vincent and the Grenadines is anchored on four (4) pillars. These are:

1. **Enhancement of physical infrastructure:** Physical infrastructure in the pilot sites that are in dire need of repairs or need to be retrofitted were identified through physical and structural inspections. Actions under these components are: 1.2.1, 1.2.2, 1.3.5.
2. **Enhancement of natural ecosystems:** Endangered ecosystems that are expressing stress due to climate variability were also identified for replanting and other distressing actions so that the country can benefit from their natural roles. Actions under this pillar are: 1.1.4, 1.2.7, 1.3.1
3. **Enhancement of regulatory and legislative tools:** In order to ensure that the institutional environment of the country can cope with the need for good governance, transparency of action, and modern democratic principles, regulatory and legislative tools that need to be upgraded were identified. Actions under these components are: 1.2.6, 1.3.3, 3.2, 3.6
4. **Knowledge management:** The underlying design parameter of the investment projects proposed is such that there should be a significant investment in the human capacity, of not only the public and private sectors but also that of the ordinary citizens, on how to cope with climate variability. This will be achieved through the training of public officials, the general public, formal and informal education, data collection and data management, data analysis and data modelling and case studies. Actions under these components are: throughout the Four Components.

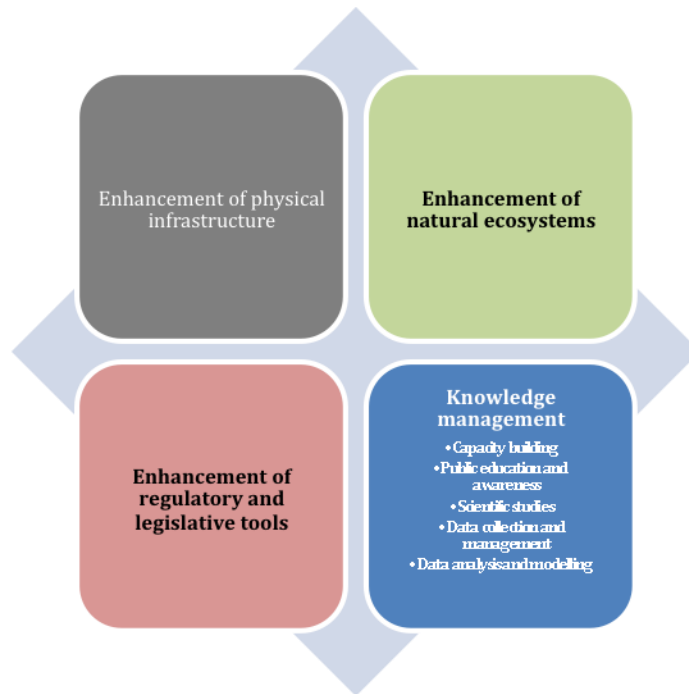


Figure 25: A Framework for Action

6.2 Guiding Principles

Building on the four pillars identified above, what has guided the planning and development of this Phase One PPCR has been twofold: i) the initial Phase One Proposal (November 2010), and ii) the need to comprehensively address the opportunities to build resilience to a changing climate in Saint Vincent and the Grenadines.

Ultimately, our collective efforts are to be directed towards minimizing the adverse impacts of climate change on families and communities. This has been the key guiding principle. Maintaining a comprehensive approach is the second.

Climate change is every body's business and we have seen how it touches all ministries, businesses and homes, particularly those in vulnerable coastal areas. Being comprehensive means many things including the following at least:

- children and youth;
- being sensitive to the special needs of women and the elderly;
- addressing basic information deficiencies and building data management capacity;
- identifying priorities for institutional capacity building (including training, professional development and equipment needs);
- collating relevant draft legislation and statutory control documents and prioritizing specific review and revision needs;
- making information and knowledge resources available to all, and
- stabilizing and protecting priority critical infrastructure.

Finally, teamwork is at the top of the list as a basic principle. Effectively facilitating the collective contributions of all involved (stakeholders, legislators, businesses, residents etc.) is the key to both

success and sustainability. The diagram below illustrates the overall approach using three pilot areas in Component 1 and how this testing and modeling contributes to the other three components.

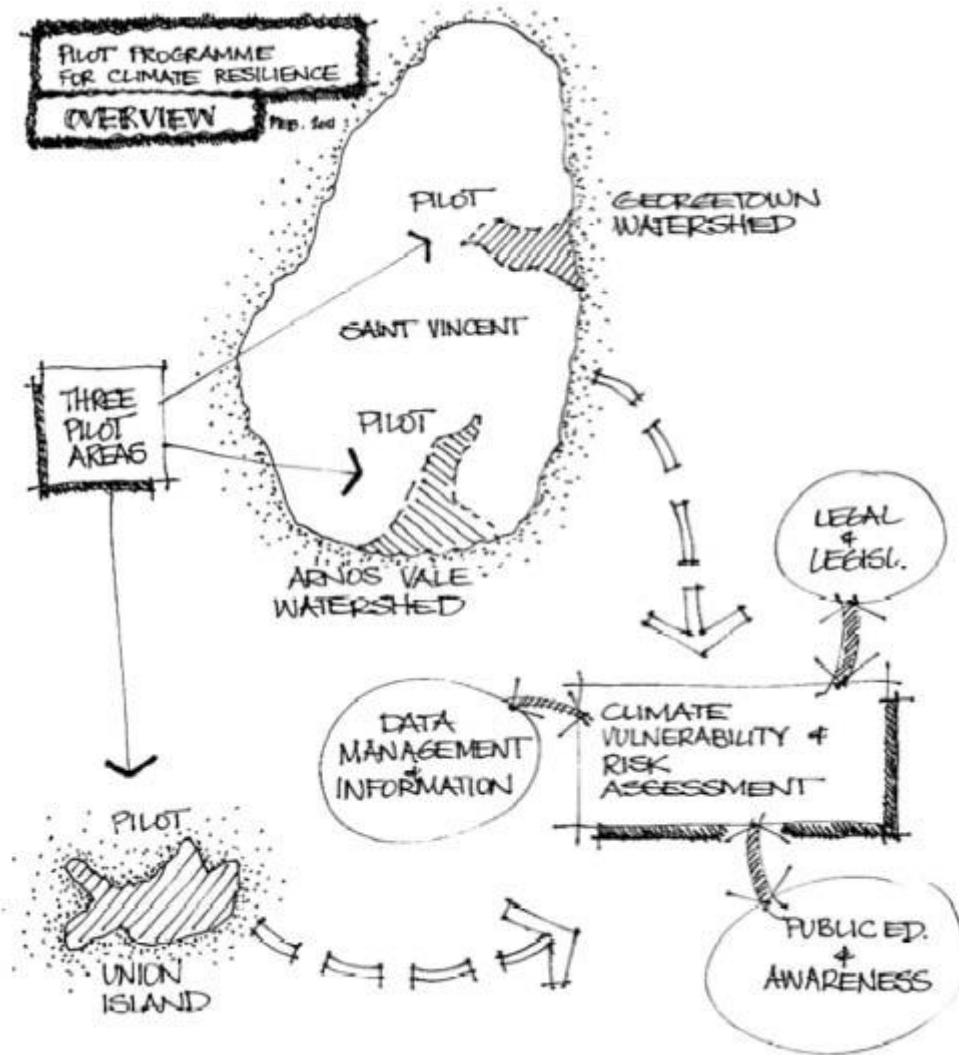


Figure 26: PPCR Overview Diagram

6.3 Financing and Linkages

The PPCR proposed investment activities are closely linked to the investments proposed under the Disaster Vulnerability Reduction Project, and indeed were developed simultaneously, with the PPCR providing the comprehensive approach to creating a programme of sustainable climate resilience and disaster risk reduction activities.

Included in the Financial Programme are projects, programmes and investment initiatives funded from three confirmed sources and one group of projects that have been identified which however have no identified source of funding. We have referred to these as the “Sponsor Wanted” group of projects. The complete list of those projects for which a funding source is yet to be determined is included in the Annexes.

To date, the following has been determined:

- DVRP has likely IDA funding of around ten million US dollars (m\$10.0)
- ERL has approved funding of five million dollars (m\$5.0)
- SPCR is applying for seven to eight million in grant funds from the CIF, combined with around two to three million in concessional financing, totalling around ten million dollars (m\$10.4).

ERL Funding

Project	Project Component #	Component 1: Disaster and Climate Risk Reduction Activities	ERL			Preliminary Costs (USD)	Implement'n	Beneficiary	Implementing Agency
			Knowledge mgmt. Consultants	Goods	Works				
ERL	E 1.1	Retrofitting of Emergency Shelters: Rose Bank (complete retrofit - physical, generators, watertanks, additional kitchen and shower facilities)		see below				MoW/MoE	MoW
ERL	E 1.2	Retrofitting of Emergency Shelters: Rilian Hill (complete retrofit - physical, generators, watertanks, additional kitchen and shower facilities)		see below					
ERL	E 1.3	Retrofitting of Emergency Shelters: Rose Hall (complete retrofit - physical, generators, watertanks, additional kitchen and shower facilities)		\$2,446,000		\$2,446,000		MoW	MoW
ERL	E 1.4	Strengthening of the Marriqua River Defense (Tiviot River)		\$416,000		\$416,000			
ERL	E 1.5	Retrofitting of Emergency Shelters: Georgetown Primary		see below		see below			
ERL	E 1.6	Retrofitting of Emergency Shelters: Georgetown Secondary		see below		see below			
ERL	E 1.7	Retrofitting of Emergency Shelters: Troumaca Ontario Secondary School		\$868,000		\$868,000			
ERL	E 1.8	Rehabilitation of secondary road - Hopewell Road River Defense and Road Reconstruction		\$400,000		\$400,000		MoW	MoW
ERL	E 1.9	Stock-piling of gabion baskets		\$290,000		\$290,000			
		SUB-TOTAL	\$0	\$4,420,000	\$0	\$4,420,000			

Figure 27: Approved Financing for the ERL Project (Hurricane Tomas).

PPCR INVESTMENT PROGRAMME
Saint Vincent and the Grenadines

PPCR INVESTMENT PROGRAMME			
St. Vincent and the Grenadines			
Project Component 1	Component 1: Climate Vulnerability, Risk Assessments and Risk Reduction		\$ 6,130,500
Project Component 2	Component 2: Data Collection, Analysis and Information Management		\$ 953,910
Project Component 3	Component 3: Strengthening of existing policy, legal and Institutional framework to address Climate Change		\$ 1,165,000
Project Component 4	Component 4: Design and implementation of a Public Education and Capacity Building Programme		\$ 805,000
		Primary total	\$ 9,054,410
		Project Management 10%	\$ 905,441.0
		Secondary total	\$ 9,959,851.0
		Contingency	\$ 40,149.00
		GRAND TOTAL	\$ 10,000,000.00

Figure 28: Summary of the SPCR Investment programme.

7. Participatory Process

7.1 Priorities – Families and Communities

In order for the SPCR to be truly driven by local and national needs, the design and selection of priority actions to build resilience in Saint Vincent and the Grenadines must come from at least three groups or communities:

- i) those most affected by a changing climate,
- ii) those most vulnerable to adverse climate impacts, and
- iii) from those in a position of responsibility to effect societal and community change.

Persons most affected by climate hazards are also those most vulnerable; women, children and the elderly and infirmed are especially vulnerable. Primary research in the social assessment was able to identify and confirm earlier investigations on social vulnerabilities. Gender sensitivities and a gender balance has been incorporated wherever possible in the SPCR.

The Technical Working Group has been the key stakeholder group involved in the SPCR from the beginning. Throughout the consultation process, we have recognised that ultimately, the proposed transformational actions to build resilience must result in a quantifiable reduction in losses from the impacts of climate hazards, for families and communities.

7.2 DVRP National Consultation Processes in 2010

Throughout 2010, teams from the World Bank, consultants and teams from various Ministries worked through a thorough process of discussions, workshops and meetings with a full range of Agencies and Ministries. The priority projects indicated in the DVRP Financial Summary (Figure 36. above) have been derived from this consultation process. For further details on the extent of the investigations and the individuals and organizations consulted, see the current World Bank Project Appraisal Document for the project.

7.3 Comprehensive Consultation – the Social Assessment in 2011

This in-depth survey was done under the direction of the Social Assessment Team in the Ministry of Finance and Economic Planning. The assessment combined both SPCR and DVRP assessments. The social impact assessment of the proposed projects listed in the DVRP was combined with the socio-economic and vulnerability assessment (for the SPCR) of families and communities in vulnerable locations, mostly coastal. With the assistance of the Statistics Division of the Ministry of Finance and Economic Planning, a statistically valid selection of communities and locations within all representative Parishes were selected for the social survey. Sixteen Field Officers were trained (one-day training with the Social Assessment Team and the Lead Consultant) to undertake a total of 350 individual surveys in Saint Vincent and on the Grenadine island of Bequia.

Climate Change, Communities and Poverty

The bottom line for our collective efforts in building resilience and the ability to cope and adapt to a changing climate in Saint Vincent and the Grenadines, and the measure by which these efforts will be gauged, is the ability to minimise loss and the adverse impacts of climate change on families and communities.

As history has shown us in the Caribbean and indeed around the world, a disproportionate number of women suffer the adverse impacts of weather-related disasters. Few studies have been conducted

specifically on the effects of climate change on agriculture in small islands. Climate change and climate variability will likely affect the rainfall regime, increase evaporation, and/or reduce soil moisture which would in turn affect agricultural production, possibly with adverse consequences for food security and nutrition.

We know that women, the elderly, children and the infirmed often suffer more than others from disaster impacts; this includes climate and weather-related hazards. The proposed implementation of Phase Two is designed to recognise and respond to those vulnerabilities wherever possible. The opportunities for gender-sensitive design and planning have been identified in the Social Assessment process, undertaken as part of the PPCR investigations in collaboration with the Social Impacts assessment carried out for the Disaster Vulnerability Reduction Project in January and February this year.

Valuable primary data collection was undertaken during the preparation of the Phase One PPCR. Considerable pre-planning ensured a practical and relevant profile of various community's vulnerabilities both real and perceived. A brief summary of some of the results of the social assessment survey are included below:

Preliminary findings for the PPCR – Social Vulnerability Assessment

The social assessment was conducted in 19 communities in Saint Vincent and the Grenadines, namely Sandy Bay, Fancy, Georgetown, Chester Cottage, Colonarie, Spring, Marriaqua, Arnos Vale, Kingstown, Buccament, Barrouallie, Cumberland, Rose hall, Rose bank, Dark view, Troumaca, Chateaubelair, Bequia and Canouan. The communities were selected based on the level of social vulnerability and vulnerability to climate change. A questionnaire was completed by a statistically valid sample of 350 persons (selection made by statistics and census divisions to ensure a good representative spread). The questionnaire was developed in-house with the assistance of the Lead Consultant, and was designed to assess the following ten issues and concerns:

1. Experience of disaster – type, impact, losses and coping mechanisms
2. Vulnerabilities – real and perceived
3. Level of preparedness
4. Awareness of climate change issues & opportunities for further education
5. The gender distinction - what were the differential impacts of the natural disasters on women and men (overall)
6. The perception of social problems in communities – gender distinction (overall)
7. Levels of preparedness relative to impact of disasters experienced.
8. Levels of preparedness relative to vulnerability.
9. The human resources that are available and in what categories.
10. The willingness of members to participate in natural disaster reduction programmes.

This survey will be extended in the early stages of the Phase Two Implementation to include a larger sample and all of the Grenadine Islands.

Although the complete analysis of the results and findings of the survey was not available at the time of writing, the preliminary findings revealed the following three main points:

1. That the communities that are socially vulnerable are equally vulnerable to adverse impacts from changing climatic conditions.
2. The impact level of natural disasters on socially vulnerable communities is much higher when compared to other communities.
3. There are higher levels of frequency of social problems in the lower income vulnerable communities.

Likely recommendations arising from the assessment process include:

- Community participation programmes - Elaboration of community risk maps - networking between families.
- Educational programmes: - to promote awareness to climate change issues, build resilience, coping in crisis situation
- Prevention programmes- Mitigation to prevent further risk. Housing and drainage aspects (Risk Management and Risk Assessment)
- Other programmes: to be designed depending on information revealed in the study

Mapping Plan: The following are variables of interest which could be represented on a map;

- ✓ Level of awareness of climate change related issues (as indicated by question) by Enumeration District.
- ✓ Water storage (an indication of preparedness) by community.
- ✓ Experience/occurrence of disasters in the past five years
 - Type of disaster (aggregate) by community and
 - Level of threat of landslide/land slippage by community
- ✓ Impact of disaster – category of losses by community
- ✓ Overall preparedness (An index using Q.44)

7.4 Consultations – groups and individuals

In addition, a number of initiatives were undertaken with a range of stakeholders as follows:

(see also the Annexes for a full record of all key meetings, workshops, brainstorming, memos and discussions)

- telephone interviews with private sector business persons on the Grenadines;
- one-on-one meetings with key stakeholders (such as the Permanent Secretary of Tourism and her Deputy for example);
- brainstorming with small teams (with key partner the Ministry of Health and Environment) and the Technical Working Group (TWG);
- brief visits to infrastructure locations (Diamond and Belair solid waste disposal areas for example), tourism locations in Bequia, coastal areas with significant vulnerabilities to talk with locals (Arnos Vale, Vila Beach, Young Island);
- periodic Memos from the Director of Planning to update stakeholders on progress, upcoming events and milestones, and to reinforce the need for comprehensive participation from these stakeholders (comprehensive list in the Annexes);
- OECS PPCR consultation in Grenada with PPCR teams from Saint Lucia, Saint Vincent and Grenada;
- The Technical Working Group and other invited stakeholders were broken into smaller groups for the Final Planning Workshops focussing on Watershed Management, Coastal Zone Management, Legal and Legislative issues.

7.5 Final Planning Workshops

The Final Planning Workshops in February considered all proposed actions in the draft Financial Plan. This draft plan included;

- i) projects identified during the PPCR investigations and research,
- ii) projects identified during the extensive national consultations and investigations for the development of the Disaster Vulnerability Reduction Programme (DVRP), and
- iii) projects identified to be implemented under the Emergency Recovery Loan (ERL).

These proposed projects were discussed again at length, reviewed for their relevance, assigning priority, agreeing on the implementing agency, assess cost estimates and confirming the main beneficiaries.

All recommended changes, additions and revisions were then incorporated into the first complete draft subsequently presented to the Second Joint Mission. Revisions suggested from the Joint Mission Team will be incorporated into the final draft Financial Plan enclosed.

Pilot areas – demonstration, implementation and modeling

Of particular significance in these final planning workshops was the confirmed suggestion to utilise three pilot areas in Component One to demonstrate and model the recommended actions of the other three components. These pilots will consist of two watersheds in Saint Vincent, and Union Island as the third. Extensive discussions followed on what would be the watersheds on Saint Vincent, how would they be chosen, what were the criteria for selection.

Essentially, the selection criteria centred on the ability of the watershed to demonstrate and implement the actions described in the other three components - that is, the area that would best demonstrate the widest range of proposed projects, with the level of vulnerability of communities and businesses as the other main criteria.

In this way, the Arnos Vale sub-watershed and the Georgetown Watershed were selected. Union Island was chosen as the Grenadine watershed. These were long and animated discussions. The Country Poverty Assessment (CPA) 2007/2008 Document also provides support to the selection of the Georgetown Watershed in that the area has been identified as one of the poorest in the country.

7.6 OECS Collaboration

As mentioned above, a most valuable OECS PPCR consultation (one full day) was hosted by the PPCR Team in Grenada, with PPCR teams from Saint Lucia and Saint Vincent and the Grenadines. A significant discussion focussed on 'commonalities' between the programmes, that there exist a number of shared components that are almost identical for each country. It is therefore recommended that all subsequent Phase II components of the Caribbean PPCR Investment Programmes be reviewed for 'commonalities' and this be undertaken on a regional or sub-regional level, such as the OECS.

*** See Annexes for a summary of the overall outcomes of these consultations

Part 2: Proposed Investment Program Components for PPCR Funding

- The Investment Programme is contained in a separate document. The arrangement of the Components has been described in the READ ME FIRST section at the beginning.
- It is important to note that each and every proposed investment project has a one-page description of the Objectives, the Activities, the Rationale and the Expected Results/Outcomes included in the Investment Programme document.

Part 3: Request for Project Preparation Funding

PILOT PROGRAM FOR CLIMATE RESILIENCE			
Project/Program Preparation Grant Request ³⁴			
1. Country/Region:	SAINT VINCENT AND THE GRENADINES	2. CIF Project ID#:	(Trustee will assign ID)
3. Project Name:	<i>Strategic Programme for Climate Resilience - Saint Vincent and the Grenadines</i>		
4. Tentative Funding Request (in USDmillion total) for Project³⁵ at the time of SPCR submission (concept stage):	Loan: USDmillion\$3.0	Grant: USDmillion\$7.4	
5. Preparation Grant Request (in USDmillion):		MDB: USDmillion\$1.22	
6. National Project Focal Point:	<i>Laura Anthony-Browne, Director of Planning, Ministry of Finance and Economic Planning</i>		
7. National Implementing Agency (project/program):	<i>Ministry of Finance and Economic Planning</i>		
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point: Kanta Kumari Rigaud</i>	<i>TTL: Niels Holm-Nielsen</i>	
9. Description of activities covered by the preparation grant:			
All components and activities described in the Table below. Commencement of activities under the Preparation Grant expected to commence at the end of Q2 2011.			
10. Outputs:			
Deliverable			Timeline
(a) Review alternative options for proposed works, prepare TOR, technical specifications and Works Schedule for River defense: Construction of gabion/reinforced concrete for the Warrawarrow including drainage improvements work: Arnos Vale Watershed			2 months Q2-Q3 2011
(b) Prepare TOR and Works Schedule for forestry management activities inclusive of Silviculture along with bioengineering works and other soil and water conservation measures for Arnos Vale Watershed			1 month Q2 2011
(c) Prepare technical specifications and works schedule for numerical and physical modeling to determine optimum shoreline stabilization techniques for the Georgetown pilot area, including ecosystem conservation, and reduction of downstream impacts in Georgetwon Watershed (In-house plus consultants)			2 months Q2-Q3 2011
(d) Prepare technical specifications for equipment needs. Acquisition and installation of telemetric hydro-climatic weather stations and software. See Equipment below.			2 weeks Q2

³⁴ A separate template needs to be presented for each project and program preparation grant request listed in the SPCR.

³⁵ Including the preparation grant request.

(e) Prepare technical specifications for development of enterprise National Spatial Data Infrastructure (NSDI)	Q2 2011
(f) Prepare TOR and detailed job descriptions for Institutional strengthening for the NEMO, MoFEP, MoHE, Ministry of Works, and Physical Planning to boost Climate Change capabilities in-house.	1 month Q2
(g) Prepare TORs for CWSA and Met Office institutional strengthening and detailed equipment needs for Met Office	2 weeks Q2
(h) Prepare TOR and detailed activities scheduling for the development of draft policy and legislation in support of mainstreaming climate change resilience into development planning. This will include the immediate needs to prepare revisions to the NESDP as a matter of urgency.	1 month Q2 URGENT
(i) Prepare TORs and implementation strategy (immediate, short and long term) for both the National three-year public education programme to build community based climate risk and resilience, and National curriculum development (including teacher training) for secondary schools in climate change and disaster risk reduction.	1 month Q3 2011
(j) Prepare TORs and implementation strategy for Planning and development of an all hazards early warning system in SVG, including special needs of women and children and the elderly.	2 weeks Q2
(k) Prepare strategic plans for the development of partnerships between Government and the Private sector. Undertake this Project as soon as possible.	Q2 2011
11. Budget (indicative):	
Expenditures³⁶	Amount (USD) - estimates
Consultants	\$255,000
Equipment	Design specification and equipment procurement \$787,000
Workshops/seminars	\$15,000
Travel/transportation	\$55,000
Others (admin costs/operational costs)	Administrative support and Project Management \$50,000. TORs for the staffing will be prepared as part of Phase One in April 2011.
Contingencies (5%)	\$58,000
Total Cost	USD million\$ 1.22
Other contributions:	
• Government	In kind technical support
• MDB	In kind technical support
• Private Sector	N/A
• Others (please specify)	N/A
12. Timeframe (tentative)	
Submission of pre-appraisal document for PPCR Sub-Committee Approval: March 4, 2011 Expected Board/MDB Management ³⁷ approval date: May 31, 2011	

³⁶ These expenditure categories may be adjusted during project preparation according to emerging needs.

³⁷ In some cases activities will not require MDB Board approval

<p>13. Other Partners involved in project design and implementation³⁸: IDB, (list SVG NGOs, private sector, etc.</p> <p>Ministry of Works Bridges Roads and General Services Authority (BRGSA) Ministry of Health and the Environment Ministry of Agriculture Forestry and Fisheries Ministry of National Mobilisation, Social Development Etc Ministry of National Security Saint Vincent and the Grenadines Port Authority Saint Vincent and the Grenadines Coast Guard Saint Vincent and the Grenadines Maritime Administration Saint Vincent and the Grenadines Fire Services National Parks, Rivers and Beaches Authority Ministry of Housing, Physical Planning, Land and Informal Settlements Attorney General’s Office</p>	<p>Saint Vincent and the Grenadines Meteorological Office Basic Needs Trust Fund (BNTF) Central Water and Sewage Authority Ministry of Finance and Economic Planning Saint Vincent and the Grenadines’ National Trust Grenadines’ Affairs SANDWATCH Saint Vincent and the Grenadines’ Hotel and Tourism Authority Private Climate Change Activists Saint Vincent and the Grenadines’ Chamber of Industry and Commerce Social Investment Fund Saint Vincent and the Grenadines Electricity Services Ltd Energy Unit National Emergency Management Organisation (NEMO) Ministry of Tourism International Airport Development Corporation (IADC)</p>
<p>14. If applicable, explanation for why the grant is MDB executed: To ensure: 1) due diligence on social and environmental safeguards, 2) financial management support, and 3) Technical assistance</p>	
<p>15. Implementation Arrangements (incl. procurement of goods and services): All goods and services will utilize international best practice according to World Bank standard procedures and will be implemented by the SVG PSIMPU.</p>	

³⁸ Other local, national and international partners expected to be involved in design and implementation of the project.

Project #	Component and Activity	Duration	Estimated Cost (US\$)
Component 1: Climate Vulnerability, Risk Assessments and Risk Reduction			
1.2.1	Review alternative options for proposed works, prepare TOR, technical specifications and Works Schedule for River defense: Construction of gabion/reinforced concrete for the Warrawarrow including drainage improvements work: Arnos Vale Watershed	2 months	US\$120,000
1.2.4	Prepare TOR and Works Schedule for forestry management activities inclusive of Silviculture along with bioengineering works and other soil and water conservation measures for Arnos Vale Watershed	1 month	US\$15,000
1.3.4	Prepare technical specifications and works schedule for numerical and physical modeling to determine optimum shoreline stabilization techniques for the Georgetown pilot area, including ecosystem conservation, and reduction of downstream impacts in Georgetown Watershed (In-house plus consultants)	2 months	US\$20,000
Component 2: Data Collection, Analysis and Information Management			
2.1	Prepare technical specifications for equipment needs. Acquisition and installation of telemetric hydro-climatic weather stations and software. See Equipment below.	2 weeks	US\$7,500
2.3	Prepare technical specifications for development of enterprise National Spatial Data Infrastructure (NSDI)	2 weeks	US\$7,500
Component 3: Strengthening of existing policy, legal and institutional framework to address Climate Change			
3.2	Prepare TOR and detailed job descriptions for Institutional strengthening for the NEMO, MoFEP, MoHE, Ministry of Works, and Physical Planning to boost Climate Change capabilities in-house.	1 month	US\$15,000
3.3 3.4	Prepare TORs for CWSA and Met Office institutional strengthening and detailed equipment needs for Met Office	2 weeks	US\$7,500
3.6	Prepare TOR and detailed activities scheduling for the development of draft policy and legislation in support of mainstreaming climate change resilience into development planning. This will include the immediate needs to prepare revisions to the NESDP as a matter of urgency.	1 month	US\$15,000

**Component 4: Design and implementation of a
Public Education and Capacity Building
Programme**

4.1	4.1a	Prepare TORs and implementation strategy (immediate, short and long term) for both the National three-year public education programme to build community based climate risk and resilience, and National curriculum development (including teacher training) for secondary schools in climate change and disaster risk reduction.	1 month	US\$30,000
	4.2	Prepare TORs and implementation strategy for Planning and development of an all hazards early warning system in SVG, including special needs of women and children and the elderly.	2 weeks	US\$7,500
	4.10	Undertake Project 4.10 as soon as possible.	2 weeks	US\$10,000
			Subtotal	US\$255,000

**Design specification and equipment
procurement**

all	(see Equipment List - these goods may be purchased using a retro-active financing mechanism)	goods	US\$786,904
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**Administrative support and Project
Management**

all	Chief Technical Advisor (International)	1 month	US\$25,000
all	Climate change specialist (National)	1 month	US\$15,000
all	Team Assistant (National)	1 month	US\$4,000
all	Procurement Specialist (National)	1 month	US\$6,000
	TORs for the above will be prepared as part of Phase 1. in April 2011.		
	Workshops/seminars		US\$15,000
	Travel/transportation		US\$55,000
	Contingencies (5%)		US\$58,000

TOTAL US\$1,219,904

List of Annexes

*** PLEASE NOTE THE ANNEXES ARE ALSO CONTAINED IN A SEPARATE DOCUMENT FOR EASE OF REFERENCE.

1. **PILOT PROGRAMME FOR CLIMATE RESILIENCE, CARIBBEAN REGIONAL TRACK FIRST PROGRESS REPORT**
2. **CARIBSAVE PROJECTS 2011**
3. **ENVIRONMENTAL LEGISLATION LIST**
4. **DISASTER VULNERABILITY REDUCTION PROJECT DESCRIPTION**
5. **LIST OF AGENCIES AND INDIVIDUALS CONSULTED**
6. **REFERENCES**
7. **BRAINSTORMING WORKSHOP SUMMARIES JANUARY 2011**
7. **KEY MEETINGS AND NOTES**
8. **CLIMATE RISKS FOR THE CARIBBEAN AND SAINT VINCENT AND THE GRENADINES**
9. **COMPLETE LIST OF UNFUNDED INVESTMENT PROJECTS (“SPONSOR WANTED”)**