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American States

STATUS OF HAZARD MAPS VULNERABILITY ASSESSMENTS AND DIGITAL MAPS

ST. VINCENT AND THE GRENADINES COUNTRY REPORT

**THE CARIBBEAN DISASTER EMERGENCY
RESPONSE AGENCY (CDERA)**

October 2003

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Preface

From 2002 – 2005, the Caribbean Disaster Emergency Response Agency (CDERA) is implementing two major regional initiatives which are designed to reduce vulnerability to natural and technological hazards. These are the Japanese International Cooperation Agency (JICA) supported Caribbean Disaster Management (CADM) Project and the Canadian International Development Agency (CIDA) supported and Organization of American States executed Caribbean Hazard Mitigation Capacity Building Programme (CHAMP). The hazard mitigation planning component of the latter is being implemented in close collaboration with the Caribbean Development Bank's Disaster Mitigation Facility for the Caribbean. Hazard maps, vulnerability assessment studies, and digital maps are critical inputs to both initiatives.

This survey reviewed the status of these thematic activities in sixteen (16) CDERA Participating States, Haiti, Martinique, Suriname and Puerto Rico over the period August – October 2003. The objectives of the Survey were as follows:

1. To determine the status of hazard maps and vulnerability assessment studies and their use in the socio-economic planning and management of the Caribbean.
2. To determine critical success factors, gaps and best practices in the preparation and use of hazard maps and vulnerability assessment studies in the Caribbean.
3. To compile a database of hazard maps, vulnerability assessment reports, and digital maps available in the Caribbean.

Hazards considered under the survey included natural hazards such as floods, hurricanes, landslides, coastal disasters (surge, wave, and erosion), earthquakes, and volcanic eruptions as well as technological hazards. The types of vulnerability assessment considered were structural, economic, and human assessments.

This report was prepared by Jacob Opadeyi, Shahiba Ali, and Eva Chin of the Centre for Geospatial Studies, Faculty of Engineering, The University of the West Indies, St. Augustine, Trinidad and Tobago.

Status of Hazard Map, Vulnerability Assessments and Digital Maps in the Caribbean: SAINT VINCENT AND THE GRENADINES

1.0 Introduction

1.1 Physical and socio-economic background

Saint Vincent and the Grenadines is a small island developing state in the Eastern Caribbean chain of islands, situated at approximately 13° 15' N and 61° 12' W. It comprises 30 islands, inlets and cays with a total area of 150.2 square miles (389 sq km). The volcanic island of Saint Vincent, with an area of 132.8 square miles (344 sq km), is mountainous and rugged, with numerous rivers flowing in deep, narrow valleys over short distances to the sea. The highest peak, Mount Soufrière standing at 3952 ft (1,234 m) in the northern part of the island, is associated with a stratovolcano, the Soufrière volcano. The islands of the Grenadines stretch over a distance of 45 miles to the south of the main island, St. Vincent. They are much smaller than the island of St. Vincent, less rugged and possess white sandy beaches.

The island has a tropical marine type of climate, being affected by the prevailing Northeast Trade winds throughout the year. Annual temperatures range from 18°C to 33°C. The dry season is from January to May and the wet season from June to December. Saint Vincent and the Grenadines is affected by weather associated with the passage of the Inter Tropical Convergence Zone, tropical storms and hurricanes, mainly from June to November, during the wet season.

The central part of the island is covered by tropical rainforest vegetation, montane forest and secondary rain forest that provide habitats for a wide range of flora and fauna.

The population of Saint Vincent and the Grenadines is about 116,812 (July 2003 est.) with 28.2% of its people under 15 years old and 65.5% making up the economically active population. 85% of the population lives on the narrow coastal strip below 5m and less than 5 km from the high-water mark. 80 % of its infrastructure and 90% of its economic investment lie within this narrow zone (OAS, 2000). Roughly 90% of the population lives on the main island of St. Vincent.

The country's economy is based mainly on agriculture from bananas and arrowroot, manufacturing industry, construction and mining, tourism and services. Its per capita GDP is an estimated US\$2,900 (2002 est.) with the sectors of agriculture, industry and services contributing 10%, 26% and 64% respectively to the GDP (CIA World Factbook 2003).

1.2 Major disaster issues confronting the country

Saint Vincent and the Grenadines is part of a volcanically active ridge formed along the subduction zone in the Eastern Caribbean. There have been five major eruptions of the Soufrière volcano recorded since European settlement, the most recent being in 1979. The volcano is active and poses a serious threat to the inhabitants of the island. As a result, the island is affected by volcanic and seismic activity. The landscape carries evidence of volcanic activity, namely lava domes, volcanic necks/plugs or 'pitons', explosion craters, pyroclastic flows and surges, and lahars. The pyroclastic flows and ash fall give the beaches of the island of St. Vincent their black colour.

Over the past 20 years, the country fortunately has not been hit by a direct hurricane, but it has experienced the damaging effects of storm surges, floods and landslides which often accompany these events. Coastal erosion is a continuous threat to property and communication networks, along with anticipated sea level rise that make the coastal zone particularly vulnerable to beach erosion, loss of habitat for marine life, loss of fresh water aquifers, and damage to coastal infrastructure.

Volcanoes, earthquakes, hurricanes, storm surges, floods, landslides and coastal erosion are potential disaster issues facing the country.

2.0 Hazard Mapping Initiatives

Table 1 provides the summary of hazard map that has been prepared in St. Vincent and the Grenadines.

Table 1 – Hazard Mapping in St. Vincent and the Grenadines

<i>Type</i>	<i>Purpose</i>	<i>Coverage</i>	<i>Scale</i>	<i>Date produced</i>	<i>Primary sources</i>	<i>Author</i>
Landslide	Not stated	Entire island	1:25000	1988	Dir. Of Overseas Surveys, Surrey, England	Jerome DeGraff

2.1 Methods of preparation and distribution

In 1985, Jerome deGraff of the Forest Service, USDA, in collaboration with the Government of Saint Lucia produced a landslide risk map of Saint Vincent and the Grenadines. He used landslide susceptibility to arrive at landslide hazard. The map shows where landslides will occur in the future and their probability of occurrence, rather than their actual occurrence. Relative landslide hazards are given in four zones of probable occurrence, namely, "Low", "Moderate", "High",

and “Extreme”. The map is meant to be used as a guide for identifying possible landslides that would affect development projects, a means for comparing the degree of possible landslide occurrence for alternatives considered and for identifying sites requiring remedial measures. The map is to be used for regional planning purposes and not for specific site use. Mr. deGraff, of the Forest Service, Department of Agriculture, was the technical specialist for the OAS, who worked on the “Natural Hazards Risk Assessment and Disaster Mitigation Pilot Project in Latin America and the Caribbean Basin”, carried out by the Department of Regional Development, OAS.

2.2 Users and uses

No information was provided on the users and uses of this study.

2.3 Current condition and limitations

The limitations listed were that the map was not in digital format and that it could only be used for comparison among areas and not for detail of a specific area.

2.4 Critical success factors

The only information provided on the critical success factors in the preparation, maintenance, and use of this study was that it was a collaborative effort of the Organization of American States and the government of St. Vincent and the Grenadines.

2.5 Respondent

Ms. Aisha Samuel, Volcanologist
Soufrière Monitoring Unit
Kingstown, St. Vincent and the Grenadines

3.0 Vulnerability Assessment Studies

Table 2 provides the summary of vulnerability assessment studies that have been conducted in St. Vincent and the Grenadines.

Table 2 – Vulnerability Assessment

Type	Purpose	Coverage	Date produced	Primary source	Author
Storm	To understand the distribution, magnitude, and frequency of storm hazard	Island wide	Yet to be determined	http://www.oas.org/en/cdmp/document/reglstrm/St_Vincent.ppt	<u>OFDA/USAID/OAS</u>
Seismic	Seismic Hazard Maps: Windward Islands	Island wide	Yet to be determined	http://www.oas.org/en/cdmp/document/seismap/index.htm	<u>OFDA/USAID/OAS</u> <u>OFDA/USAID/</u>
Multiple hazards (landslides, floods, wind, volcanic eruptions, earthquakes)	To audit the vulnerability of the St. Vincent's Electric Company (VINLEC)	Island wide	Yet to be determined	http://www.oas.org/en/cdmp/document/vinlec/vinlec.htm	
Beach erosion	To assess the nature of and mitigate against beach erosion	Island wide	1998	http://www.unesco.org/csi/act/cosalc/rochvin.htm	Bequia Community High School, Ministry of Agriculture, Lands and Fisheries. <u>University of Puerto Rico, Sea Grant College Program Caribbean Development Bank UNESCO Environment and Development in Coastal Regions and in Small Islands</u>

3.1 Methods of preparation and distribution

No information was provided on methods of preparation and distribution of the study.

3.2 Users and uses

No information was provided on users and uses of the study.

3.3 Current condition and limitations

No information was provided on current condition and limitations of study

3.4 Critical success factors in its preparation, maintenance, and use

No information was provided on critical success factors in its preparation, maintenance, and use of the study.

3.5 Respondent

Ms. Aisha Samuel
 Volcanologist
 Soufrière Monitoring Unit
 Kingstown
 St. Vincent and the Grenadines

4.0 Digital Maps

Table 3 provides a listing of digital maps that are available in the country. The Spheroid of the maps is Clarke 1880 Modified with datum being St. Vincent and the map projection used is Transverse Mercator British West Indies Grid.

Table 3: Digital maps Available in St. Vincent and the Grenadines

<i>Theme</i>	<i>Input scale</i>	<i>Year produced</i>	<i>Coverage</i>	<i>Format</i>	<i>Primary source</i>
Hazards					
Contours	1: 25 000		Island of St. Vincent		Physical Planning Unit, Ministry of Planning
Agricultural Land use	1: 25 000		Island of St. Vincent		
Soils					
Vegetation					
Geology					
Roads	1: 25 000		All islands		Physical Planning Unit, Ministry of Planning
Rivers	1: 25 000		All islands		

Rainfall					
Buildings					
Bridges/Culverts					
Settlement					
Population					
Coastline	1: 25 000		St. Vincent		Physical Planning Unit, Ministry of Planning
Coastline	1: 25 000		Grenadines		
Reefs	1: 25 000		Tobago cays		
Bathymetry	1: 25 000		Southern St. Vincent, the Grenadines		
Urban areas	1: 25 000		Island of St. Vincent		

5.0 Conclusions and Remarks

It appears that not a lot of work has been done on hazard mapping and vulnerability assessments for St. Vincent and the Grenadines. However, as part of the OECS Emergency Recovery and Disaster Management Project, some work is in progress by the Ministry of Works on retrofitting buildings designated as shelters and on health centres (Pers. Comm. Mr. Hudson Nedd, Project Coordinator, Emergency Recovery and Disaster Management Project.)

Reference

OAS 2000. Initial National Communication on Climate Change, St. Vincent and the Grenadines. <http://unfccc.int/resource/docs/natc/svgnc1.pdf>

Appendix 1

Persons interviewed in Saint Vincent and the Grenadines

Contact	Position	Agency	Tel. No./Fax. No	Email
Colville Alexander	Accountant	National Emergency Management Office	Tel: 1-784-456-2975	jomocol@hotmail.com
Aisha Samuel	Volcanologist	Soufrière Monitoring Unit (SMU)	Tel: 1-784-455-1111, Ext.320	ais_sam@yahoo.com
Hudson Nedd	Project Coordinator	OECS – Emergency Recovery and Disaster Management Project	Tel: 1-784-457-1738	svgpcu@vincysurf.com
Augustin Power	Assistant Secretary (Insurance)	Min. of Finance & Planning	Tel: 1-784-456-1111. Ext 406	powaz@hotmail.com

Colin Campbell	Planning Officer/GIS Manager	Central Planning Unit, Min of Finance & Planning	Tel: 1-784-457- 1746	cenplan@caribsurf.com
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