



BRITISH VIRGIN ISLANDS

Integration of Disaster Risk Management into the Development Agenda

A BEST PRACTICE CASE STUDY



Prepared for

The Caribbean Risk Management Initiative



By

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FINAL REPORT

FOREWORD

Several significant events related to disaster risk reduction and the planning process have occurred globally during the compilation of this case study. The tsunami in southern and southeastern Asia in December 2004, underscored natural hazard risk to coastal developments and island environments; The World Conference on Disaster Reduction (WCDR) held in Kobe Japan (January 2005) sought to move the Disaster Reduction Agenda forward. Unprecedented levels of hurricane activity have highlighted vulnerability of small and large states, and earthquakes have triggered significant loss of life and property.

The strategy document emanating from the conference, entitled The Hyogo Framework for Action, resolves to pursue *“the substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries”* by 2015. The Framework outlines three strategic goals to achieve this:

- *More effective integration of disaster risk into sustainable development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction;*
- *Development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can contribute to building hazard resilience; and*
- *Incorporation of risk reduction approaches into emergency preparedness, response and recovery programmes in the reconstruction of affected communities.*

The Caribbean Disaster Response Agency (CDERA) presented a Strategic Framework document for the period 2005-2015 which identified activities and targets to link the WCDR Agenda with the provisions of the Caribbean Comprehensive Disaster Management (CDM) Strategy adopted by CARICOM in 2001.

The 2005 hurricane season has set records in timing, number and impact of events. The forecast for the season has been exceeded and for the first time on record named storms have exhausted the Roman alphabet and the Greek alphabet has had to be used. The impact and outcome of Katrina on the Gulf coast of the United States of America (September 2005) has sent shock waves throughout the world.

Experiences within the Caribbean and elsewhere have underscored the imperative for a paradigm shift in approaches to disaster management, and the paradigm presented in this study offers recommendations for consideration by Small Island Developing States in particular.

The British Virgin Islands (BVI) has developed its National Disaster Organisation in a targeted manner, has developed and implemented procedures for risk identification, and preparedness and response, and has enacted legislation and policy. Development of the BVI's Disaster management agenda provides lessons on the value of strong visionary leadership, building institutional and human resource capacity, and enacting an appropriate policy and legislative framework.

We thank the members of the project team, Eleanor Jones, lead consultant, Ivan Alert, Monica Williams and Aedan Earle who contributed their professional expertise to the execution of the study. We thank especially Governor Thomas Macan, Deputy Governor Mrs. Dancia Penn, Financial Secretary Glenroy Forbes, Ms. Sharleen daBreo, Disaster Coordinator, Mr. Elton Georges, retired Deputy Governor, and the many leaders in the public, private and civil sectors who willingly shared knowledge, insights and experiences.

To the UNDP we say congratulations on commissioning this study, which we hope will add to the body of knowledge supporting the urgency for disaster risk reduction strategies in the Caribbean and other Small island Developing States.

Eleanor B. Jones
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Kingston, Jamaica
September 2005.

MAP of the BRITISH VIRGIN ISLANDS



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Acronyms

ADRA	–	Adventist Disaster Relief Agency
BVI	–	British Virgin Islands
CBO	–	Community Road Organisation
CDM	–	Comprehensive Disaster Management
DAC	–	Disaster Auxiliary Cortos
DDM	–	Department of Disaster Management
DPU	-	Development Planning Unit
EWS	-	Early Warning System
HDI	-	Human Development Index
Mo NLR	–	Ministry of Natural Resources and Labour
NDMC	–	National Disaster Management Council
NDMP	–	National Disaster Management Plan
NDO	–	National Disaster Organisation
NEEC	–	National Emergency Executive Committee
NEO	–	National Emergency Organisation
NEOC	–	National Emergency Operations Centre
NGO	–	Non - Governmental Organisation
NIDP	-	National Integrated Development Plan
NIDS	–	National Integrated Development Strategy
UNDP	-	United Nations Development Program
VITEMA-		Virgin Island Territorial Emergency Management Agency
ZC	–	Zonal Committees

PICTURES ON COVER

Soper's Hole Marina on the West End of Tortola
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The Baths, Virgin Gorda, British Virgin Islands
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A Best Practice Case Study for the Caribbean Risk Management Initiative

THE CASE of the BRITISH VIRGIN ISLANDS (BVI) 1983 – 2005

...To achieve more sustainable human development that moves towards meeting the Millenium Development Goals (MDGs) we must meet the challenge of integrating disaster risk management into the planning and policy frameworks at all levels". BCPR, 2005

PART I INTRODUCTION

1.0 THE REPORT

- 1.1 This final report on the Best Practice Case Study includes a definition and description of the Paradigm of disaster risk management integrated into the development agenda, a documentation of integration of disaster risk management into the development agenda of the BVI, and a comparison of the paradigm developed with the case study of the BVI. The report submits conclusions and suggests recommendations.
- 1.2 The Best Practice Case Study is being undertaken in support of the Caribbean Risk Management Initiative (**CRMI**), which was launched in 2004 against a background of the growing recognition that disaster risk can be either reduced or aggravated by policy and individual choices at the levels of government, private sector, and civil society. The CRMI is designed to build capacity within the Caribbean Region to adequately address the growing occurrence of natural hazards and environmental risks as well as to emphasize the concept of climate change and social vulnerability. The cumulative goal of the activities for the Initiative is to strengthen disaster and risk management activities within the Caribbean.

2.0 DEFINITIONS

Disaster Risk Reduction/Disaster Reduction (DR)

- 2.1 The repeated onslaught of natural hazards globally as well as increasing scientific information have served to heighten attention to the need for reducing the impact of these events. It has been clearly demonstrated in several jurisdictions and in several development initiatives

that investments in risk reduction measures can pay large dividends in terms of reduced losses and retention of development gains. The United Nations International Decade for Natural Disaster Reduction (IDNDR) 1990 – 2000 stimulated an acceleration of data gathering and support for national, regional, and global programmes and the recently concluded World Conference on Disaster Reduction (2005), the BPOA+ 10 meeting in Mauritius (2005) and the World Summit on Sustainable Development (2003) all re-emphasised and strengthened the call for Disaster Risk Reduction.

2.2 The International Strategy for Disaster Reduction (ISDR), the global framework established to succeed the IDNDR secretariat in the most recent edition of *Living with Risk* (2004) defines The Disaster Risk Reduction framework as:

- 2.2.1 Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis
- 2.2.2 Knowledge development including education, training, research and information
- 2.2.3 Public commitment and institutional frameworks, including organisational, policy, legislation and community action
- 2.2.4 Application of measures including environmental management, land use and planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments
- 2.2.5 Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities

(ISDR, 2004)

Disaster Risk Management

2.3 Risk Management in the classic sense includes risk identification, risk reduction and risk transfer. The ISDR defines Disaster Risk Management as “**a systematic process of using administrative decisions, organisation, operational skills and capacities to ...lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards**”. (ISDR, 2004)

2.4 The UNDP in its recent publication *Reducing Disaster Risk... (2004)* differentiates two types of disaster risk management as they relate to development planning:

Prospective disaster risk management - integrate into sustainable development

planning. Review development programmes and projects for their potential to either reduce or aggravate vulnerability and hazard.

Compensatory disaster risk management - stands alongside development planning, with a focus on ameliorating existing vulnerability, and reduction of accumulated hazard, that has accumulated through past development pathways. (UNDP, 2004).

Integration – What Does It Mean?

2.5 The World Conference On Disaster Reduction 2005 (WCDR) sought to *inter alia* “Promote integration of disaster risk reduction into development planning and practice through the identification, assessment and monitoring of risk” and to “share best practices and lessons learnt to further disaster reduction within the context of attaining sustainable development”. Integration may also be taken to mean “mainstreaming”, and the concept involves including hazard-related risks as an integral part of the project cycle - project design, appraisal and evaluation – and not merely as an add-on. In addition, policies and programmes should take on board very early in the design stage considerations of hazard risk exposure and vulnerability. It is important that the potential impact of development on hazard risk be equally considered, as development often exacerbates natural vulnerability – disasters being both a cause and a product of failed development (UNDP, 2004). Mainstreaming should therefore ensure that all projects and programmes take account of disaster risks and seek to reduce impacts; ensure that projects/programmes do not build or exacerbate vulnerability to disaster physically, socially, ecologically, and economically; ensure that relief and rehabilitation programs contribute to development goals while reducing future risk.

2.6 Yet another consideration of “integration” involves an inter-sectoral and inter-disciplinary approach integrating prevention, mitigation, response and recovery into the broad framework of sustainable development.

2.7 International Financial Institutions have recognized the significance of disaster reduction measures to the full achievement of development programmes and are instituting the required steps in project cycle and policy.

2.8 The mainstreaming of disaster reduction into development and post-disaster recovery has become an essential component of UNDP's approach to building a capacity for sustainable human development, and the sharing of information on strategies and best practices for reducing disaster risk and vulnerability – the subject of this report - is one aspect of this work.

Development Agenda

2.9 The development agenda may be considered the programme of activity scheduled over a period of time to advance social, economic and financial indicators within the BVI. This agenda would include policies, programmes and projects within identified sectors and would seek to address the vision of the government for the territory.

Climate Change Adaptation

2.10 Small island developing states are extremely vulnerable to the consequences of global warming and climate change and the actions designed and implemented to reduce aspects of this vulnerability are collectively referred to as “adaptation”. The “no-regrets approach” stipulates that actions will enhance vulnerability reduction whether or not the impacts of climate change are directly encountered by the specific place.

Caribbean Risk Management and Climate Change Adaptation

2.11 The Caribbean Risk Management Initiative through which this Case Study of the BVI is being developed includes consideration of mainstreaming climate change adaptation in development decision-making. Under the ACCC Project a manual of guidelines was produced to address approaches to the identified adaptation needs. (CRMI, 2003).

2.12 The ACCC guidelines reiterate the understanding that one of the major environmental challenges facing the Caribbean is global climate change and its associated consequences. It recognizes the physical reality of global warming as well as the uncertainty of the extent and nature of future climatic conditions, which uncertainties, pose a challenging decision making environment. Importantly, it is noted that in such an environment it is difficult to convince policy makers to take action. While a risk management approach is suitable for bringing some precision to the decision making process, a useful strategy for encouraging action could be to promote activities which contribute to national sustainable development goals which need to be carried out in any event. (“*no regrets approach*”). An additional approach recommended is to promote integration of risk management activities into the framework of sustainable development.

2.13 The guidelines are consistent with, support and build upon existing International, Regional and Sub-regional mandates which address sustainable development and the specific concerns of SIDS. These include:

- *The Barbados Programme of Action for SIDS*
- *The St. Georges Declaration of Principles for Environmental Sustainability in the OECS*
- *Declaration of the World Summit on Sustainable Development*
- *The Strategy and Results Framework for CDM*
- *International Strategy for Disaster Reduction*

2.14 A six-step decision making process is presented as guiding principles for mainstreaming climate change:

2.14.1 Stakeholder involvement

2.14.2 Communication

2.14.3 Promotion of Sustainable Development

2.14.4 Documentation

2.14.5 Maximize use of existing tools, human and technical resources, local expertise and knowledge

2.14.6 Public Education and Awareness

2.15 Action steps toward adaptation planning or the risk management process as it applies to climate variability and change involve:

2.15.1 Getting Started

2.15.2 Analyzing the Hazard

2.15.3 Estimating the Risk

2.15.4 Evaluating the Risk

2.15.5 Adaptation, Risk Control and Financing

2.15.6 Implementation and monitoring.

2.16 Considerations of risk reduction in the BVI must take account of climate change adaptation planning particularly given the vulnerability of the territory to sea level rise and variable and volatile climatic conditions.

3.0 SUMMARY TERMS OF REFERENCE

3.1 *General responsibilities* of the consultant undertaking the assignment as defined in the terms of reference are:

3.1.1 To develop a paradigm for a best practice that integrates risk management into a country's development agenda.

3.1.2 To document the integration of risk management into the development agenda of the BVI.

3.1.3 To compare the paradigm developed to the BVI's case study and make conclusions and plausible recommendations.

3.2 *Specific Responsibilities* were stated as:

- To suggest a definition of the concept of integration of risk management into the development agenda for the purpose of this study.
- To design and describe a paradigm of risk management integrated into the development agenda.
- To document the integration of risk management into the development agenda of the BVI

3.3 *The tasks* outlined for the consultant therefore included:

3.3.1 To develop a paradigm of a best practice for integrating risk management into development agenda.

3.3.2 To Document the best practice of the BVI in integrating risk reduction into the development agenda according to the paradigm developed in task 1.

3.3.3 To compare the best practice case study with the paradigm developed and make recommendations to improve the integration of risk reduction in the development agenda of the BVI and other Caribbean countries.

Appendix I presents the full Terms of Reference.

4.0 THE APPROACH

4.1 A multidisciplinary team comprising environmental risk management and development professionals was assembled to execute the project. The team employed an integrated approach to structured interviews, document review, analysis and interpretation. Each professional brought his and her respective discipline and expertise to bear on the investigations, paradigm development, documentation and recommendations.

Team members were:

Eleanor B. Jones Environmental Risk Management and Development Specialist,
Lead Consultant

Aedan Earle Hazard mapping and Disaster Management Specialist

Ivan Alert Attorney-at Law and Disaster Management Specialist

Monica Williams Economist and Development Analyst

4.2 Work was done in four fundamental components:

- Background research and consultations were employed to define key concepts and essential operational definitions to be used in the case study.
- A paradigm /framework was designed and described for a best practice for integrating risk management into a development agenda.
- In- country field investigations involved further document review, consultations and structured interviews, and analysis
- Preparation of final reports

4.3 Documents reviewed included reports/discussions related to current trends and perspectives on disasters and development. Particular attention was paid to integrating disaster risk reduction into development planning, disaster management strategies, project reports and policy statements within the Caribbean in general, and in the BVI in particular.

4.4 Some key questions investigated in relation to integration in the BVI included:

- To what extent has disaster risk management (DRM) been taken up as a crosscutting theme in national development strategy processes and programs?
- To what extent have synergies been created between DRM and other development goals?
- To what extent have policy commitments on integrating DRM into development been operationalised?
- To what extent have changes been made in key elements (e.g. human and financial resources, institutional culture) to meet requirements of integration DRM into the BVI development agenda?
- How has investment in DRM contributed to public protection and safety?

4.5 Some elements explored and examined included:

- The Enabling Environment - Political commitment, Policies, Global, Regional, National mandates, Human & Financial resources, Legislative provisions, Participation and contribution of civil society.
- Integration through Institutionalization: Institutionalizing Disaster Risk Management - Structures, mechanisms, processes in place to guide plan promote monitor and evaluate the process of integrating DRM in the development agenda of BVI.
- Key issues effecting and affecting integration: Knowledge – Cognitive, Affective and Behavioural elements; Ownership –culture, disaster/development nexus, disaster reduction and development assistance, Competition – priority setting, central/local relationships; Challenges and opportunities.

PART II THE PARADIGM FOR INTEGRATING RISK MANAGEMENT INTO THE DEVELOPMENT AGENDA

5.0 THE PARADIGM

In keeping with the Terms of Reference the Paradigm is expected to consider:

5.1 Disaster Management Information

- Hazard identification
- Vulnerability assessment
- Response capacity evaluation
- Risk assessment
- Disaster scenario design

5.2 Prevention/Mitigation

- Legislation/Regulations
- Policies and Plans
- Organizations
- Retrofitting/ Maintenance
- Structural changes
- Re-location
- Land development
- Land use
- Physical planning
- Law enforcement

5.3 Preparedness

- Legislation
- Policies
- Organizations
- Facilities
- Equipment
- Planning (emergency and recovery)
- Training
- Simulation exercises
- Education and public awareness

5.4 Integration

5.4.1 Integration of disaster risk reduction into the development agenda should therefore take account of the scientific information on the hazards, vulnerability assessments, administrative procedures and structures, development programmes and policy through the phases of identification, development and appraisal, as well as sectoral planning, civil society engagement, and community resilience. The concept speaks to the application of science and technology, partnership and networking, financial instruments, education and training.

5.5 Mainstreaming

5.5.1 Six key areas crucial to the process of mainstreaming have been identified by **Tearfund** (2005):

- Policy
- Strategy
- Geographical planning
- Project cycle management
- External relations
- Institutional capacity

5.5.2 Further, there are some key influences:

- Institutional capacity
- Institutional blockages/barriers
- Workload
- Lack of leadership
- Control
- Lack of skills and knowledge
- Time

5.6 The Caribbean Comprehensive Disaster Management (CDM) Strategy and Results Framework

5.6.1 The CDM strategy as endorsed by **CARICOM** and by member governments of the **Caribbean Disaster Response Agency (CDERA)** states as the **Goal – Sustainable Development In The Caribbean**, and the **Strategic Objective** seeks *integration of CDM into*

the development processes of CDERA member countries (APPENDIX II). In the context of the strategy this means that the full range of government agencies and private sector players should incorporate vulnerability information and mitigation measures into their development planning and decisions.

5.6.2 Further, the strategy indicates that such integration requires knowledge of prevalent hazards and vulnerabilities as well as knowledge of structural mitigation techniques, costs and benefits. “CDM requires effective institutional and regulatory mechanisms that set and promote the application of appropriate standards. It requires economic and financial incentives...” (CDERA/UNDP/USAID, 2001).

5.6.3 The Intermediate Results targeted were:

1. Stronger Regional and National Institutions
 - Build the capacity of the regional organization, national disaster organizations and research and data partners
2. Research and training
 - Develop curricula at educational institutions to support hazard and environmental management
 - Build capacity of research and technology institutions for hazard assessment, mapping and early warning systems
 - Apply research and make widely available information on hazards, vulnerabilities and protective measures
3. Regional institutions and donors incorporate CDM into their own programs and promote CDM to their national members/clients
 - Donors adopt policy requiring hazard assessment and mitigation for project approval
 - Key economic sectors actively promote disaster management
 - Insurance and Finance industries adopt disaster management principles
4. Preparedness, response and mitigation capability enhanced and integrated
 - Legislation to support disaster management
 - Disaster management plans adopted, tested and reviewed
 - Emergency operations facilities equipped and in state of readiness
 - Lifelines and critical infrastructure protected by mitigation measures
 - Mitigation included in response, recovery and reconstruction
5. Hazard information incorporated into development planning and decision-making.
 - Physical planning includes hazard and vulnerability information

- Policy-makers sensitized to implications of disaster management for economic growth and political stability

5.7 Summary

5.7.1 In the *paradigm for integrating disaster risk management* incorporates the elements listed above as posited by UNDP, by the Caribbean CDM strategy, and by la Trobe and Davis (Tearfund). The paradigm therefore includes:

- ✓ National and sectoral policies for disaster risk management
- ✓ Strategic programme of action for mainstreaming disaster risk management
- ✓ Understanding and acceptance by policy-makers of the importance of disaster risk management to economic, social and environmental viability (sustainable development)
- ✓ Strong leadership at the national governmental level – **a Champion**
- ✓ Integration of disaster risk management with the Environmental Impact Assessment Process and with the project cycle.
- ✓ Acquiring scientific knowledge of natural and technological hazards at the selected geographic location
- ✓ Knowledge and assessment of the patterns of land and livelihood that may be exposed to the respective hazards -physical, ecological, economic and social vulnerability assessment
- ✓ Assessment and strengthening of institutional capacity – all related agencies, organizations and institutions should include disaster risk management in planning and operations and should be able to extend the concept to related constituencies – management, staff and “customers”.
- ✓ Education and awareness programmes that elaborate the relevant hazards and related risks, provide skills, and allow for understanding and application of the appropriate measures to minimise social and economic loss and dislocation
- ✓ Incorporation of disaster risk management in donor programs
- ✓ Incorporation of disaster risk management in key economic sectors including finance and insurance
- ✓ Community involvement in all phases of Disaster management planning – CBOs and NGOS
- ✓ Engagement of the private sector with all phases of Disaster management planning
- ✓ Disaster management legislation
- ✓ Incorporation of disaster risk management in planning legislation
- ✓ Disaster plans – national and sectoral
- ✓ Emergency operations procedures and facilities
- ✓ Protection of critical infrastructure and lifelines with appropriate mitigation measures

- ✓ Disaster risk reduction measures applied during the response and recovery phases of a disaster

PART III - THE CASE OF THE BVI

6.0 DEVELOPING THE DISASTER RISK REDUCTION AGENDA IN THE BVI – MILESTONES

6.1 Several milestones have been identified in the development of the disaster management agenda in the BVI and these relate primarily to events, organisational/institutional arrangements, and hazard and risk assessments.

Early Years

6.2 In the formative years of the BVI disaster management program, the disaster management agenda was heavily biased towards awareness and preparedness. Local capacity was weak and this was reflective of the general condition across the Caribbean at the time. Human resources were limited to a single individual on a part-time basis and personnel with disaster specific knowledge and training did not exist. Budgets were small and there was no organization. Work agendas were developed and funded generally on an annual basis and they tended to be driven by a single hazard, namely hurricanes.

6.3 There was no integrated planning for macro development and little or no collaboration existed between various departments in the island and off the island with respect to the different aspects of the island's administration and development. The Governor's office was responsible on island for disaster management, and agreements were entered into between the US Dept of State and the British Foreign and Commonwealth Office and in turn the USVI and BVI through which cooperation on issues related to disaster management could be addressed.

6.4 Significant achievements were realized at the cognitive level with the small population quickly becoming aware of the hurricane threat and potential consequences. Agendas tended to be dominated by training, awareness initiatives and to the development of some protective measures through the development of shelters. Later shelter programs would emerge. Some degree of organizing among local authorities took place even in the absence of an established organization. As capacities were built up, and throughout the 1990's, full-time skilled professionals were engaged, and budgets and agendas were expanded. Emphasis continued to be placed on awareness, training and the development of contingency plans. Preparedness and response capacities were progressively developed. Part and parcel of the development in this period was the recognition of the multi-sector involvement required and that threats existed from multi-hazards and not only or primarily from hurricanes.

National Emergency Organisation

6.5 Concurrently institution building began to be addressed. These efforts were built upon the tentative foundations of earlier organizing efforts and relationships, which had emerged both within the island and with external agencies. They consolidated and eventually expanded the disaster management arrangements into the National Emergency Organization that exists today and which is established in government policy and at law. From the early days a disasters and development nexus existed from the work of projects such as the PCDPPP (1980-1990) and agencies such as UNDRO. However, somewhere in the process of institution building the development connection though not lost was not as equally visible and frequently used in the language of emergency preparedness and response.

6.6 Towards the mid-90's and thereafter, agendas addressed multi-sector, multi-hazard disaster management and also began to place attention and emphasis beyond preparedness and response to also address other parts of the disaster management continuum, that is, prevention, mitigation, rehabilitation and recovery. By the late 1990's, agendas and instruments by which disaster management programs were institutionalized, were reflective of what in the Caribbean region has come to be termed ***Comprehensive Disaster Management (CDM)***.

Comprehensive Disaster Management (CDM)

6.7 Thus in the BVI, its Disaster Management Act 2003, its policies, plans, programs, organizational structures and disaster management processes use the language of, and embrace the concept of Comprehensive Disaster Management. Comprehensive Disaster Management embraces a view of the society that is at risk to multi-hazards, as requiring multi-sector involvement in all phases of the disaster management continuum. Through that approach the society will address potential and actual risks. The Comprehensive Disaster Management agenda in the BVI had, in concept and practice by early to mid 2000, achieved a significant level of penetration at the cognitive and affective levels, and to some extent at the behavioral levels in public departments. It is significant that the ODP (prior to DDM) was involved in the development of the island's National Integrated Development Plan, which was developed over several years and published in 1999. In that National Integrated Development Plan vulnerability and risk reduction were given prime attention and specific sections of that Plan addressed disaster reduction.

6.8 Integration of disaster risk reduction into the routine work programs and development agendas of all public departments and in other sectors is stipulated in legislation, but has been slow to be implemented. The Health sector has led the way in terms of the establishment of a full-time post of Health Disaster Coordinator.

6.9 The CDM Strategy and Results Framework as developed by the USAID/CDERA/UNDP programme was adopted and adapted by the BVI following national consultations and consensus. Subsequent action plans have expanded some of the recommendations and implemented programs in each of the strategic objectives. The Comprehensive Disaster Management (CDM) paradigm while it accommodates risk reduction treats hazards as the impelling force. The Disaster Risk Reduction (DRR) paradigm treats development and development choices as the driving force. The two are complementary and the risk reduction paradigm builds on the CDM approach.

Policy and Planning

6.10 Establishment of the Department of Disaster Management (DDM) in 2000 heralded a new and expansive phase of disaster management in the BVI. Several initiatives have been accomplished as the Government of the BVI has sought to build on accomplishments and to strengthen and deepen risk reduction measures as well as preparedness and response procedures. ***The Mitigation and Development Planning Framework, Disaster Management Act, Disaster Management Policy and the Strategic Management Plan 2004-2008*** are some notable interventions.

6.11 **Table 6.1** below documents events and policies as selected milestones, which are deemed significant to the evolving best practices within the BVI. This tabulation suggests a sequence of events and actions, which can further inform development of a risk reduction agenda in other SIDS within the Caribbean and elsewhere. Several initiatives identified can be considered “creative” in terms of concept and timing.

Table 6.1 - Selected Milestones on the Disaster Management Agenda

Milestone	Date	Comment
Hurricane Frederick	1979	
Deputy Governor assumes responsibility for Disaster Preparedness	1980	US\$3,000 Budget
Disaster Preparedness Office Established	1983	
Hurricane Klaus	1984	
Hurricane Hugo	1989	
Full time Disaster Coordinator Appointed	1990	
Disaster News – Public Information Magazine	1991	
First National Disaster Management Plan	1993	US\$60,000 Budget
Hurricane Shelter Safety Assessment	1993	
Hazard Risk Assessment Project (HRAP)	1995-1997	
Telecommunications Plan	1997	
Disaster Auxiliary (Volunteer) Corps	1997/1998	
Community Emergency Organisation	1997	
Hurricane Georges	1998	
National Integrated Development Strategy (NIDS)		
Department of Disaster Management (DDM) established	2000	\$600,000 2003 budget
H. Lavity Stout Community College – tertiary level Disaster Management Programme	2000	
Public Sector Development Programme (PSDP)	2001(?)	
Comprehensive Disaster Management Strategy and Results Framework	2002	
Mitigation & Development Planning Framework	2002	2002-2011
Disaster Management Act	2003	
Change of Administration	June 2003	
Disaster Management Policy Framework		
National Disaster Management Council		
Updated Telecommunications Plan		
Multimedia Public Information Programs		
Sector Plan – Health		
Health Disaster Coordinator	2003	
Capability Assessment of Key Agencies		
National Hazard Disaster Coordination	2003	
British Virgin Islands' Department of Disaster Management (DDM) Strategic Management Plan 2004-2008	2004	
Physical Planning Act	2004	
Social Vulnerability Assessment	2004	
Poverty Study	2004	

7.0 SITUATIONAL ANALYSIS

Hazard Vulnerability and the Natural Environment

7.1 Located in the northeastern Caribbean Sea, 60 miles east of Puerto Rico, are the British Virgin Islands (BVI), an archipelago comprising over 50 islands, rocks and cays, and covering an area of approximately 153 square km (64 sq miles).

Figure 7.1 Location of BVI



7.2 The natural environmental character of the BVI is dominated by the archipelagic nature of the island territory, the volcanic and coralline origin of the islands, as well as the geographic position which influences weather and climate and natural hazards.

7.3 Hurricanes, other tropical weather systems and earthquakes are the most significant natural hazards and the island territory is vulnerable to wind damage, flooding, storm surge, earth tremours and landslides.

7.4 Within the past 20 years there have been a number of hurricanes, tropical storms and other extreme rainfall events, which have heightened awareness and sharpened attention to the need for disaster management. Indeed as noted in Section 3 and further elaborated in **Section 6** events have served as a major catalyst for implementation of the many facets of the disaster management programme in the BVI.

7.5 Seismic risk is often “overlooked” in the BVI, but the territory is located in a tectonically active region. Indeed, two earthquakes were recorded in early 2005. The islands are located close to the northern edge of the Caribbean tectonic plate and close to significant seismographic structures such as the Anegada trough. A detailed seismic study was carried out for the BVI in 1996 by William Ambeh. The study sought to determine the ground-shaking hazard to which the BVI is exposed in terms of the potential horizontal acceleration. In addition, a microzonation analysis was conducted to determine the localised effects caused by surficial deposits that have a tendency to amplify ground-shaking effects. Liquefaction potential at selected reclaimed land sites was examined and the tsunami hazard was reviewed. Results of these assessments are available for use in physical planning and development projects.

Settlement Patterns

7.6 The four main inhabited islands are:

1. Tortola/Beef Island – 54 square km/22 square miles
2. Anegada – 38 sq. km/15 sq. miles
3. Virgin Gorda – 21 sq. km/8 sq. miles
4. Jost Van Dyke – 10 sq. km/3 sq. miles

7.7 Total population is estimated at 22,643 (July 2005) and 16,630 of that number resides on Tortola. Between 1980 and 1990 the population increased by approximately 45% from 11,000 to 16,000, with most of the increase attributed to the net immigration flow. The rate of population growth decreased in the 1990s to an average annual increase of about 2%, but the population is projected to double by 2030. 74% of the population lies in the 15-64 year age cohort and the median age is 31 years.

7.8 Spatial patterns of settlement have been influenced by the distinctive surface form and placement of each island, and in turn the topography of each of the inhabited islands. The terrain is generally rugged, with a scarcity of flat land leaving a relatively large proportion of undeveloped land. On the most developed and populated island of Tortola, undeveloped land accounts for

approximately 73% of the total acreage, with the majority of the development in the capital, Road Town, and East End.

7.9 Tortola houses the administrative capital, economic and business centres, as well as tourism and international transportation infrastructure. The other islands accommodate mainly tourism accommodation and attractions with boating and other marine activity a major component.

7.10 Development has been mainly at or near sea level on relatively level ground, but with increasing population and development, there has been pressure to build on slopes, which are prone to instability and drainage inadequacies. In that regard development has been creating some additional vulnerability, and provisions of the Physical Planning Act (2004) and Environmental regulations should be reviewed and enforced.

Environment and Sustainable Development

7.11 One of the eleven stated strategic objectives of the National Integrated Development Strategy (NIDS) is to ensure environmental sustainability, and one of the five development themes is "promoting and maintaining ecologically sustainable development."

7.12 In pursuit of Sustainable Development for the BVI, the government proposes the following:

7.12.1 Conducting environmental assessment as a part of regular project evaluation to determine their impact on the environment or the use of natural resources.

7.12.2 Encouraging harmonious development that will minimise impacts on land and marine environments by maintaining an acceptable level of land use functions

7.12.3 Initiating urban renewal plans and assess carrying capacity

7.12.4 Improving supervision of development sites and increasing awareness of best practices

7.12.5 Harnessing the environment to expand domestic food production through careful application of science and technology

7.12.6 Increasing budgetary allocations to key environmental agencies including government departments, NGOs and international Organisations

7.13 The NIDS consultative process and the subsequent analysis indicated that physical vulnerability includes the effects of natural and technological disasters such as hurricanes, earthquakes, oil spills, flooding, landslides and other man-made disasters impacting on the physical

environment of the BVI. With Tourism as one of the major economic activities of the BVI, it is clear those activities that are capable of degrading the natural environment are also capable of adding or contributing to the level of economic vulnerability.

7.14 The focus of the strategy to reduce physical vulnerability is centred on helping communities to deal with disasters, improving disaster preparedness, mitigation and recovery systems, enhancing environmental management, establishing construction and financing mechanisms to replace damaged infrastructure, and reducing the levels/impact of external shocks from the global markets. Generally, these activities are designed to improve resilience to disasters and emergencies. The BVI government proposes to further improve the emergency services and enhance disaster management capacity.

7.15 The research, analysis and consultative process of the National Integrated Development Strategy (NIDS) concluded that *the environment* is a major asset as well as a constraint for future sustainable development of the BVI. Limited physical space and pressure on the terrestrial and marine environment add to the development challenges for the territory.

7.16 BVI faces increasing competition for the use of natural resources, leading to problems of conservation of biodiversity, fresh water resources and watershed areas, as well as coastal and marine resources. This is a significant problem because tourism, a critical element of the country's comparative advantage, depends heavily on the natural environment and the adequate management of the fragile ecosystem. Other environmental challenges are associated with inadequate physical infrastructure, especially poor drainage and insufficient solid waste and sewerage disposal facilities. Generally, the natural resource base is fragile because of the nature of the islands.

7.17 To ensure environmental sustainability, the NIDS consultative process recognised the need to initiate development planning that treats economic, social, spatial and environmental elements in an integrated manner. In recognition of the significance of the environment, the focus continues to be on solving the present environmental problems facing the country.

7.18 Generally, the GoBVI recognizes that an effectively managed environment requires:

7.18.1 More timely execution of the programmes embodied in the environmental legislation and enforcement of environmental laws

7.18.2 Strategic linkages to avoid a fragmented institutional framework for environmental management

7.18.3 Increased allocation of funding of the environmental function

7.18.4 Increased human resources capability.

7.19 One of the most critical issues relates to the need to develop the capacity of the environmental management framework to effectively address concerns. This would serve to reduce the dispersed management responsibilities among a number of departments including the Department of Agriculture, National Parks Trust, Conservation and Fisheries Department and the Town and Country Planning Department. The GoBVI has indicated that a new agency will be formed – Department of Environment and Planning. The Conservation and Fisheries Department will be incorporated.

7.20 In spite of the articulated concern for environmental integrity, planning and conservation are in direct conflict in some areas – mangroves destroyed, salt ponds filled in, slopes accommodating high levels development and drainage inadequate, as mentioned above. The consequences of these inappropriate decisions have included flooding, landslides and social dislocation. Some developments are proceeding in a manner that compromises the ability of the environment to renew itself and to protect the islands from geophysical and meteorological hazards.

Socio-political Setting

Policies

7.21 Prior to the period 1983 to 2000 development planning in the BVI was project-driven and to a great extent donor driven based on Memoranda of Understanding (MOU). Between the mid - 1980s and mid 1990s the approach to development planning involved a new focus on the needs of the BVI and the initiatives on poverty reduction, and women in development as articulated in the donors' agenda, which included Human Rights, Gender and Poverty Reduction. By 2000 the BVI's approach to sectoral development planning was changed to "integrated planning."

7.22 A National Integrated Development Strategy (NIDS) was adopted by the government to "promote sustainable development of the territory". The strategy was informed by an extensive consultative and participatory process as it sought to build upon and consolidate results of earlier planning initiatives. It was anticipated that the strategy would reduce overall vulnerability of the BVI, which as stated above derives from size, population makeup, openness of economy, topography and fragile environment, *inter alia*. The ultimate objective was to promote environmental sustainability, improve physical development and infrastructure, strengthen institutional capacity, and sustain economic growth.

7.23 NIDS, a medium to long term five to ten year programme, was established on 22 August 2001 and is being funded by both national and donor contributions. The commencement of implementation of the NIDS was a significant achievement for the Government of the BVI, and the Strategy was supported by a National Integrated Development Plan (NIDP). The NIDS is currently in its fourth (4th) year of implementation, but there have been some changes in approach and nomenclature.

7.24 A change of political administration in 2003 brought a new Prime Minister and Ministerial responsibilities. This change followed on an extended period of over twenty years of the same administration, during which time continuity of planning facilitated execution of the disaster management programme on an on-going basis. The present government policy has maintained the commitment to disaster reduction in the Territory.

7.25 Over the last 20 years the focus of development policy of the BVI has been on the economic and social sectors, with an emphasis on transforming the BVI from a primarily agricultural society to a highly competitive and leading centre for Tourism and financial services. For Tourism the core policies were focused on improving the quality of the tourism product and services, and enhancing the image of the BVI as a superior tourist destination. Specific to the core policies in this regard are:

1. Management of the sector
2. Provision of infrastructure
3. Establishment of a conducive investment climate
4. Preservation of the environment

7.26 For the Financial services sector, the focus was on the creation of a world - class environment for the operations of the related institutions. In this regard, several legislative and regulatory measures were attached to the core policies to afford a competitive advantage of operators in the BVI. Other measures included:

1. Facilitating an effective, responsible and internationally reputable management structure
2. Expansion of the private sector activity – particularly in areas of possible linkages with the major areas of economic activity.
3. Providing a better quality of life through implementation of policies to facilitate improved health, education and welfare services. This has resulted in the high Human Development Index (HDI) based on UNDP criteria.

Governance

7.27 The BVI is a British dependent Territory. There is a unicameral legislature comprising fourteen (14) members and elections are constitutionally due every 5 years. The UK government through an appointed Governor retains responsibility for external affairs, defense, international representation, law and order, and the public service. The Governor has reserve legislative powers and normally acts upon the advice of the Executive Council (the quasi-Cabinet) over which he presides formally, and which comprises the Chief Minister, the Attorney General and three other Ministers. The governor also appoints as Chief Minister one of the elected members of the legislature.

7.28 The UK Foreign and Commonwealth Office is responsible for promoting “good government”, including proper financial regulation, and has oversight fiduciary responsibility.

7.29 The strategic ***Vision*** of the BVI is presented as:

“A society that is globally competitive and socially cohesive; that is able to satisfy the basic needs of its people; that upholds the principles of equity. Human rights, and good governance; that manages the natural resources of the territory in a sustained and integrated way; that generates self-confidence among the people; and that maintains the unique cultural identity of the territory.”

The vision is informed by four main principles:

- Inclusion of all social partners
- Environmental sustainability
- Social acceptance
- Contribution to an internationally competitive society.

7.30 *The Mission*

To mobilize and deliver resources to ensure the health, productivity, prosperity, cohesiveness, and resilience of the people in a responsible and integrated manner.”(NIDS, 1999)

The Mission represents the purpose of the Government in serving the territory as a whole.

Agencies and Disaster Management

7.31 There are some 66 Ministries and agencies, and the challenge of capacity enhancement to prepare disaster plans and operating procedures is great given technical resource constraints. All Government Ministries are involved to some degree in some aspect of disaster preparedness in the BVI. Some Ministries have specific responsibilities for hazard reduction. The following are the agencies with primary responsibilities for carrying out mitigation activities (**Table 7.2**)

Table 7.2 Agencies and Disaster Management

MINISTRY	DEPARTMENT	RESPONSIBILITY
1. The Governor's Office	The Department of Disaster Management (DDM).	The DDM has the responsibility for development of policies and programmes for the mitigation of the impacts of natural and technological hazards. The DDM performs a co-coordinating and monitoring role.
2. The Chief Minister's Office	Town and Country Planning Department	The Chief Minister's Office is a major co-coordinating agency. The Town and Country Planning Department is the agency with major mitigation responsibilities under this Ministry. This department is responsible for physical planning, monitors and controls the development of land in the territory and in this regard the development plans incorporate information on hazards and indicate vulnerable areas.
3. Ministry of Finance	Development Planning Unit (DPU)	<p>The Ministry of Finance advises on issues of economic policy and financial affairs, which includes taxation, public borrowing, recurrent and capital expenditure and fiscal management.</p> <p>The DPU is responsible for mitigation activities, national plan formulation, policy development and co-ordinates national project development activities.</p> <p>This agency's support in ensuring that hazard mitigation is an integral part of all economic planning and recognizing the need and making provision for funding of mitigation projects is vital to the implementation of the plan.</p>
4. The Ministry of Communication and Works	Public Works Department	The Ministry of Communication is a major implementation agency and has in its portfolio responsibility for the following departments:

		<ul style="list-style-type: none"> • Telecommunications • Public Works • Water and Sewerage • Fire and Rescue Services <p>The Ministry is responsible for project development, co-ordination and development of infrastructural works, and enforcement of construction standards for both public and private development; plays a major role in interpreting and executing mitigation projects.</p>
5. The Ministry of Natural Resources and Labour (MoNRL)	Departments of Environment, and Agriculture	The MoNRL is responsible for ensuring the conservation, protection and proper use of the natural environment in the BVI. In this Ministry the Department of Environment is the agency responsible for environmental policy and environmental management in the territory and has a major role to play in environmental protection.

Economic Base

7.32 The performance of the BVI economy differs markedly from that of several other Caribbean territories. While several other economies are characterised by low growth rates and GDP per capita, high unemployment and poverty, the BVI economy has grown steadily over the last 20 years. Available statistics for the period from 1994 indicate that the BVI economy grew at an annual average rate of >6% in real terms between 1994 and 1997. This rate of growth represented one of the fastest in the region in comparison with a growth rate of <2% for other countries (NIDS,1999). GDP per capita is estimated to have increased from \$20,817 in 1993 to \$33,713 in 2000 and is currently one of the highest in the world.

7.33 There is almost full employment and labour is imported. The Human Development Index (HDI) – a broader measure of social development shows that the BVI falls in the high human development average range of 0.8000 with little evidence of poverty (UNDP, 2004).

7.34 In spite of the ravages of the hurricanes in the late 1980s and 1990s, over the last 20 years the BVI economy remained positive due to sound economic management which included the timely entry into the international financial services industry supported by favourable market conditions.

7.35 Tourism and international financial services represent the engines of growth, accounting for more than two thirds of GDP, wages and salaries, Central Government revenues and international trade. International financial services represent the largest foreign exchange earner, followed by Tourism. Agriculture accounts for less than 2.8% of GDP. (NIDS, 1999)

7.36 The private sector in collaboration with government - as facilitator, regulator and provider of physical infrastructure and developer of human resources - plays a pivotal role in the economic engine of the BVI. The foreign private sector heads the leading sectors.

7.37 As an open economy – small size and narrow production – international trade dominates all social and economic activities by significantly impacting on government revenue through import duties which stood at 14% during the period 1993-2000. During the period 1997-2002 there was an average trade deficit of \$161M, however, a surplus of \$235M on trade of services compensated for the shortfall.

7.39 Fiscal operations reflect a steady increase in revenue and expenditure. Direct revenues derived from the offshore financial services sector represent the top contributor to the fiscal revenue position; with direct revenues showing an increase from \$24.3M in 1993 to \$87.1M in 2000, compared to total revenue moving from \$70.5M to 183.1M during the same period. There was a steady increase in offshore revenue over total revenues and other services.

7.40 The development agenda of the BVI will continue to be dominated by the income from the offshore financial services industry and tourism as long as there are no unexpected shocks from external market forces. This territory has the distinctive advantage of a strong economic and financial base, and this has facilitated development of the disaster management agenda.

7.41 In summary, the BVI disaster management programme has had the distinct advantage of continuity in government administration, and a strong financial base. Several SIDS lament the inability to make significant strides due to repeated changes in government policy or focus, and weak budgets. The context of hazards, vulnerability and attention to environment and sustainable development is germane to the need for mainstreaming risk reduction.

8.0 SIGNIFICANT CATALYSTS

Natural Hazard Events

8.1 As has been stated above the occurrence and increasing frequency of hurricanes served to focus attention on the need to establish management procedures, which would reduce the impact on the population, infrastructure and economy of the islands. Some of these significant events are tabulated below to illustrate the BVI record of the event and the respective impact. (Table 5.1) There is a close relationship between the occurrence of these events and the programme of capacity building for preparedness and vulnerability reduction in the BVI.

Table 8.1 Hurricane Events

Hurricane Name	Date	Category and Direction	Damage Assessment
Donna	September 1960	Category 4 hurricane, passed about 15 miles north of Anegada	Whilst no lives were lost as a result of this hurricane Tortola lost all telephone communication and Anegada suffered extensive damage to boats and 27 houses badly damaged.
Klaus	1984	Tropical Storm US\$150 million damage No warning – territory unprepared	
Hugo	1989	Category 4 hurricane, passed 60 miles south east of Tortola with sustained winds of 135-160 mph.	Electricity and telecommunication infrastructure was badly damaged as well as housing structures. Total damage caused by Hurricane Hugo was estimated at US\$40 million representing more than the BVI governments' recurrent budget spending for 1989.
Luis	September 6, 1995.	Category 4 hurricane with maximum sustained winds of 115 mph passed 37 miles northeast of Anegada	While only minor damage occurred in Tortola, Anegada suffered significant damage to fishing equipment and houses.
Marilyn	September 15, 1995	Strong Category 2 hurricane passed 40 miles to the south west of Tortola	Storm surge was estimated at 3 feet and significant damage to the coastline occurred along the south coasts of Tortola. The central mountain peaks of the island experienced wind gusts of 170 mph. Total damage was conservatively estimated at US\$10

Hurricane Name	Date	Category and Direction	Damage Assessment
			million with US\$300 in damage to the electricity grid.
Bertha	July 8, 1996	Weak Category 1 hurricane with maximum sustained winds of 75 miles per hour passed directly over the BVI	Total damage as a result of this minimum hurricane was estimated at US\$1 million.
Hurricane Georges	September 1998		
Hurricane Jose	October 1999	90 mph winds. Little damage	
Hurricane Lenny	November 1999		US\$5mill – Fuller economic assessment +US\$25million
Hurricane Debby	Aug 2000		Minimal damage

8.2 In response to the events of the late 1970s the Pan Caribbean Disaster Preparedness and Prevention Project (PCDPPP) was established and several training programs were offered to help build capacity within the region. The BVI participated in these through the part-time officers.

Leadership, Vision and Political Support

8.3 Effective highly placed leadership provided the champion needed to propel the BVI Disaster Management Program. High-level government support was initially championed through the Deputy Governor (DG) Elton Georges who understood the need and provided the focus for transformation from an incident response approach to preparedness, structured response and prevention. DG Georges was supported by strong Disaster Coordinators, who provided visionary leadership throughout the varying stages of development. Jennifer Worrell was the first full-time disaster coordinator to be appointed and she introduced an effective communication program to increase awareness among key stakeholders, and initiated hazard vulnerability assessments, and other pioneering initiatives during her tenure from 1990 – 1995. Donovan Gentles and Franklyn Michael succeeded, and each of their respective periods placed a defining imprint on the programme. The Department of Disaster Management under the leadership of the current Coordinator Sharleen DaBreo, has made significant strides and continues to provide effective leadership in Disaster Reduction initiatives.

8.3 Progress in telecommunications was championed by Mr Arthur Swain (deceased May 2005) who established the Government Emergency Operations Centre in the Cable and Wireless Building in 1985, and moved to several quarters before finding a permanent home at the DDM.

8.4 The role of individuals cannot be overstated, and it is important to note that in the developmental stages of a disaster management program well-placed champions are key to success. The case of the BVI exemplifies this.

Communication and Public Awareness

8.6 Disaster Management has achieved a high public profile in the BVI through effective multimedia public information programmes over the past fifteen years. Programmes have been implemented at several levels in government, community and private enterprise and the results have been far reaching. The institutional framework is further elaborated in **Section 9, Best Practices**.

Finance

8.7 As indicated above the sound economy and financially strong revenue base enabled investment support for development of the strong disaster management programme, which characterises the BVI today. The importance of this factor has been highlighted in the case of the BVI. In addition, and very importantly, the Budget allocation for disaster management has facilitated development of the portfolio. An emergency fund operates to support contingencies associated with extreme events.

9.0 BEST PRACTICES

Legislative and Regulatory Framework

9.1 A regulatory infrastructure has been put in place in the BVI to enable appropriate action by the relevant authorities and individuals in times of emergency. In addition, more recent Planning regulations will assist disaster reduction (prevention and mitigation) modes. Effective disaster reduction requires a strong legal and regulatory framework. BVI has noted that provisions of the recently enacted Disaster Management Act have already served to foster the required response to DDM stipulations.

Disaster Management Act

9.2 The Disaster Management Act (2003) casts responsibility of key individuals such as the Governor and Director to ensure that preparedness and response capacities are addressed. For the Governor duties include:

- Coordinate emergency management activities
- Procure and requisition supplies, medicines, materials and equipment

- Institute training
- Carry out studies and surveys necessary to ascertain capabilities for emergency management phases, including preparedness and response.

9.3 The Director is mandated to:

- Assist the Governor in coordinating general policy relating to mitigation, preparedness, response, and recovery from emergencies and disasters
- Prepare the national disaster management plan, which must include several specified preparedness and response procedures.

9.4 The Disaster Management Act 2003 requires permanent secretaries and all heads of government bodies to prepare internal disaster plans. This provision in legislation has led to an improvement in compliance with the Governor's directives.

National Disaster Management Plan

9.5 The National Disaster Management Plan (Revised 2002) is an overarching comprehensive document that includes other subsidiary plans. It was developed continually over several years commencing in the 1990's and has been periodically revised. This plan along with several of its subsidiary plans were developed by the ODP/DDM with some support from external agencies and professional consultants, and it provides for policies and procedures as follows:

- Damage and Needs Assessments
- Requesting Disaster Assistance, Management of Donated Goods, Relief Distribution and Use of Volunteer Services.
- Pre- trans- and post- disaster response and recovery operations
- Law enforcement and Use of Military Support
- Transportation
- Public Works and Engineering operations
- Fire Service
- Public Health, Medical, Mass Care and Mortuary
- Search & Rescue
- Hazardous Materials (HAZMAT) Procedures
- Coordination of Energy and Utility Services in Disaster Operations
- Animal Population in Disasters
- Weapons of Mass Destruction and Counter Terrorism Operations
- Storage of Vital Records
- Operation of the National Emergency Operations center (NEOC)

9.6 Natural and technological hazard specific plans have also been drafted and these include:

- Hurricanes and Tropical Storms
- Earthquakes
- Floods
- Landslides
- Tsunami
- Drought
- Transportation Accidents: Air, Sea (Ferry and Cruise Ships), Land
- Fires
- Terrorist Incidents, including bomb threats
- Mass Gatherings

9.7 Included under the umbrella are also:

- National Mitigation Strategy
- National Integrated Development Strategy
- National Recovery Plans
- Agency plans
- The External Affairs Disaster Plan
- The Oil Spill Plan
- Major Economic Sector Plans
- Telecoms Plan
- Evacuation Plan

9.8 The National Disaster Management Plan identifies roles and responsibilities and addresses the key issue of direction, control, and coordination in emergencies, primarily in its subsidiary National Emergency Operations Centre (NEOC) Plan. **The NEOC Plan** outlines the procedures to be followed when activating, operating, and deactivating the National Emergency Operations Centre

National Disaster Management Policy

9.9 In 2003, a formal government policy on disaster management was issued by the Office of the Deputy Governor and in that very year many of the organizational arrangements, policy products, plans and practices were enshrined in law with the passing of the Disaster

Management Act 2003. Policies and practices drove the development of disaster risk reduction arrangements and law later consolidated those developments.

9.10 The legislative framework establishes the primary institutions exercising responsibility for disaster reduction, and specifies roles and responsibilities. More importantly, however, it was crafted and operates in ways that provide for involvement of the key institutions responsible for governance and administration of the island, it establishes mechanisms for accountability, and promotes ownership.

9.11 Plans for the progressive development of risk reduction in the BVI are clearly articulated in this government policy that involves a shift away from the perception that disasters are rare occurrences managed by emergency rescue and support services. It is intended that government would provide leadership to promote shared awareness that all agencies, community organizations and individual households must come together to reduce risk and vulnerability.

9.12 Planning embraces several time horizons, which include a 10- year mitigation strategy, a 5-year comprehensive disaster management plan, and annual work programs. This planning is coordinated and led by the NDMC and DDM, and involves representatives of all government departments as well as key private sector and significant civil society bodies. Responsibility for this level of planning falls to the office of Governor and the principal institutions for governance in the island.

9.13 Legislatively the Governor is mandated to “cause to be prepared a comprehensive plan and program, which are to be integrated into and coordinated with other plans of the government.” He is supported in the discharge of this responsibility by the Director of the DDM who assists with coordinating the general policy of the government relating to comprehensive disaster management.

9.14 Legislation provides also, that the Director must prepare within 3 months after the end of every year, a report on the department (DDM) for the preceding year and transmit it to the Governor who has to present it to the Executive Council of the island for approval, and cause copies of it to be laid before the Legislative Council of the Island. That annual report must include a Disaster Management Policy Review relating to Comprehensive Disaster Management in the Territory. When the policy review is approved by the Executive Council and after it has been laid before the Legislative Council the Director has to publish the approved policy review in the Official Gazette and a newspaper published and circulating in the island.

9.15 This planning process is therefore subject to, and enjoys very high-level scrutiny and robust debate. It involves the principal institutions of governance and personalities responsible for island administration. It is a legislatively mandated process and forms part of the annual routine in governance of the island. The system is so designed and operated that it ensures involvement and critical analysis of the primary institutions for governance, collective ownership of the final output and accountability through annual reviews.

9.16 Since the early 1990's, plans and annual work programs have been developed by national coordinators, and these plans and programs have been submitted for funding through the annual budget process. There has been established also, a system of accountability through annual reporting on those work plans which now reflect the shift to the 5 year comprehensive disaster management plan and are generally in consonance with the 10 year time horizon planning goals for risk reduction.

9.17 The 10-year (2001-2011) Mitigation and Development Planning Framework has been prepared as well as a National Hazard Mitigation Policy for the BVI.

9.18 The Disaster Management Act 2003 also mandates the Director to prepare at regular intervals, not exceeding 5 years, a National Disaster Management Plan, and it specifies several procedures, which it must include such as procedures for threat alerts, maintaining disaster inventories, mobilization, communications, relief supplies, health threats and evacuations. That Plan has to be submitted to the Governor and reviewed by the highest disaster management advisory body the NDMC. After its review it is submitted to the Island's Executive Council for approval. On approval it is then published in the Official Gazette and forms part of government's official policy on disaster management.

9.19 In addition to the National Disaster Management Plan, legislative provisions are made for the Director to develop special area precautionary plans for the mitigation and prevention of disasters in especially vulnerable areas. Such plans support permitting decisions of the Land Development (Control) Ordinance (Chapter 241), the Building Ordinance (Chapter 234) or any other enactment.

Physical Planning Act (2004)

9.20 Passed in 2004, the Physical Planning Act seeks to ensure orderly development, which incorporates environmental, and natural hazard considerations into development design and approval. Passage of this legislation is a significant contribution to the integration of disaster

reduction considerations into development planning. Enforcement will be necessary to ensure optimal effectiveness.

Institutional/Organisational

9.21 Several organisations and institutions comprise the institutional framework for integrating disaster management into development planning. Evolution of this network of arrangements for comprehensive disaster management and risk reduction in the BVI has been influenced by several factors some of which have been noted above. These include:

- Emergency and disaster events: in and outside of the BVI.
- Training opportunities being made available.
- Identification of suitable personnel: Investment in their education and training in disaster reduction.
- Idiosyncratic factors: Commitment and dedication of key persons to championing the institutionalization of mechanisms for disaster risk reduction.
- Political commitment across all administrations: continuity of policy and provision of funding.
- Studies and Projects: Commitment to implementation of recommendations.
- Legislative Framework: give clear mandates, define roles and responsibilities, promote inclusiveness and collective ownership, mandate review and accountability.

9.22 Prior to 1983 there was reportedly no organized arrangement in the island for emergency preparedness and or disaster management. In 1979 Hurricanes David and Fredrick passed approximately 200 miles south of the island but still brought with it high winds and heavy rains onto the BVI. At that time an entire generation had lived with little idea of what a serious hurricane could do as it was not since 1924 that a serious hurricane had impacted the island. Shortly thereafter the first region-wide effort to build disaster reduction capacity i.e. the Pan Caribbean Disaster Preparedness and Prevention Project (PCDPPP) began to offer disaster related training to countries and the BVI took advantage of the opportunities offered. According to former Deputy Governor, Elton Georges, that was really the starting point to upgrading the institutional capacity to confront disasters in these little territories in the Eastern Caribbean, the BVI included. (Georges, 2005)

Establishment of the Program

9.23 The BVI was able to establish its disaster preparedness program in 1983 with a budget of \$3000.00 and a single desk officer who had several other responsibilities. Subsequent disaster events reinforced and convinced those concerned. In 1984 Tropical Storm Klaus caused

significant damage resulting in what is still the highest recorded damage of any Storm according to DDM reports of \$150 million. That was sufficient to show that the island needed to strengthen and deepen its resources, but it was Hurricane Hugo in 1989 that proved to be the major watershed. It is still remembered as the worst storm to affect the island, but it had a positive effect in raising the profile of disaster preparedness and promoting its importance in the BVI.

9.24 The following year, 1990, the Territory engaged its first full-time Disaster Preparedness Coordinator. From humble beginnings with a very small budget and a single part-time officer, efforts at institutional building evolved to a full-time officer with a more substantial budget and an assistant. By 1993, the Office of Disaster Preparedness, as it was then called, had an annual recurring budget of \$60,000.00, an increase of 20 times that which it started out with in 1983. Programmatically however, emphasis was still on preparedness and response even though focus had expanded to cover multi-hazards to which the island had been assessed to be at risk.

9.25 Between 1990 and 2002 a total of three professionals from the Caribbean region served as full-time Disaster Coordinators in the BVI; the first from 1990-1994, the second from 1995 to 1998 and the third from 2000-2001.

9.26 In 2002 investment in tertiary level education and training of BVI Islanders in disaster management began to yield return on investment with the return and subsequent appointment to the post of Director of a local professional. Other locals have been supported to undertake tertiary level education and training in disaster related disciplines both locally and at external institutions.

High Level Leadership and Support

9.27 From inception and throughout the first 20 years of its life, the Deputy Governor of the Island, Elton Georges was at the centre of efforts to build the national disaster management system. His commitment and influence in this regard is recognized throughout the island and across the Caribbean. Through his steadfast efforts the BVI has developed a formidable National Emergency Organization that is institutionalized into the island's laws, policies, organizational structures, plans, programs and processes for island administration. Arguably one of his most significant influences may have been the inspiring of long-term political commitment to risk reduction in the island's ruling elites. The need for and significance of a champion has been clearly exemplified through the work and achievement of Deputy Governor Georges (now retired).

9.28 It may be noted that throughout that period despite the formation of different governments a single political party was in power throughout. However, even though another political party

ascended to office in 2003 there has been no adverse effect to date on the vision, programs, organization or budgeting of the disaster management program. Personalities in the current government had already been involved in the disaster management processes of the island prior to their election to office. Inclusion in the capacity building processes and in the development, review and approval of policies, plans and programs of the island for disaster management resulted in a very high level of certainty and continuity in the work plans and programs of the DDM. The newly appointed directorate in 2003 reaffirmed its commitment to vulnerability and risk reduction.

The Organization 2005

9.29 Through a series of small continually progressive steps the BVI managed to move its program from a single part-time officer to a full-time officer with an assistant, an expanded budget, and now to a formidable national emergency organization with a credible recurrent annual budget, its own offices and full-time technical level posts and support staff. Throughout the period of the 90's there was continual development of the National Emergency Organization, and by 2003 the organizational structures were enshrined in government policy and in legislation. In 2003 the annual recurring budget was in excess of \$600,000.00.

How Does The System Function?

National Emergency Organisation

9.30 The National Emergency Organization (NEO) is the name given to the umbrella network of units and authorities concerned with the various aspects of Disaster Management in the Territory of the British Virgin Islands as specified in the Disaster Management Act 2003 and the National Disaster Management Plan (NDMP).

National Disaster Management Council (NDMC)

9.31 The National Disaster Management Council is the central institution of the NEO as established by the Act. Its role is to review the national strategy for, and the state of disaster management in the Territory and make recommendations to government. It has several sub-committees, which are required to develop national plans and procedures to deal with the impact of hazards in their areas of responsibility. The Governor is Chairman and the Chief Minister is the Deputy Chairman of the NDMC.

9.32 The terms of reference for the NDMC, which should meet annually, are to:

- Provide policy directives for the organs comprising the NEO.

- Review and monitor the national strategy for dealing with disasters, which addresses the areas of Preparedness, Mitigation, Response and Recovery.
- Assign responsibilities to the NEO.
- Make recommendations to government on manpower and physical resources for operations before, during and after a national disaster.
- Review and evaluate national plans and procedures.
- Review the work of the National Sub-committees.
- Monitor and supervise the annual work program of the DDM.
- Advise on the overall coordination and planning of disaster related activities.

9.33 Composition of the NDMC is multi agency, multi-sector: public and private sector as well as civil society and inclusive in nature as seen in its composition as follows:

Ex Officio Members

- I. The Governor
- II. Chief Minister
- III. Financial Secretary
- IV. Commissioner of Police
- V. Chief Fire Officer
- VI. Director Health Services
- VII. Director of Planning & Statistics
- VIII. Chief Environmental Health Officer
- IX. Director Public Works
- X. Director of Marine Services

Other Members

- XI. General Manager, BVI Electricity Corp.
- XII. Chief Engineer-Water & Sewerage Department
- XIII. Director, BVI Tourist Board
- XIV. Director, BVI Red Cross
- XV. President, Disaster Auxiliary Corps (DAC)
- XVI. Chief Conservation and Fisheries Officer, Conservation & Fisheries Department
- XVII. Chief Information Officer, Department of Information & Public Relations
- XVIII. General Manager, Cable & Wireless W.I. Ltd
- XIX. Director, Civil Aviation Department
- XX. Chief Physical Planning Officer
- XXI. Permanent Secretary, Ministry of Health & Welfare
- XXII. Chief Education Officer, Department of Education & Culture

- XXIII. President BVI Christian Council
- XXIV. Director, Adventist Disaster Relief Agency (ADRA)
- XXV. Representative, Disaster Management Zonal Committees
- XXVI. Representative, Broadcasting Industry
- XXVII. Representative, Building Industry/Building Professionals
- XXVIII. Representative, Financial Services Industry
- XXIX. Representative, Insurance Companies
- XXX. Representative, BVI Marine Association
- XXXI. BVI Chamber of Commerce and Hotel Association

The Governor may co-opt other persons to attend meetings.

National Emergency Executive Committee (NEEC)

9.34 The main sub-committee of the National Disaster Management Council is the National Emergency Executive Committee (NEEC). The NEEC acts for the Council between meetings. It serves as a sounding board on disaster related issues, reviews the work of other sub-committees, gives guidance and provides technical support to the DDM. The NEEC meets on a quarterly basis or as required in an emergency. The Governor may call the Committee to meet if he thinks fit or is requested to do so by the Chief Minister.

Department of Disaster Management (DDM)

9.35 The main executing agency established by the Disaster Management Act is the Department of Disaster Management (DDM), which exercises day-to-day responsibilities and serves as the national focal point for disaster reduction. The Administrative Head of the DDM is the Director who reports to the Chairman of the NDMC through the Deputy Governor.

9.36 The Department presents as its mission the following:

“... will seek to reduce loss of life and property within the territory of the BVI by ensuring that adequate preparedness and mitigation measures, and response and recovery mechanisms are established to counteract the impact of natural and technological hazards.”

During a national emergency, operations are directed from the **National Emergency Operations Centre**. The Deputy Governor serves as Director when the Centre is activated and the Director of Disaster Management serves as Operations Officer.

Emergency Telecommunications Plan

9.37 An emergency system includes equipment placed in communities, on the main islands, and in key agencies. This network facilitates integrated communications to the various publics and is important to relief, response, relief, recovery and reconstruction.

National Integrated Development Strategy (NIDS) / Plan (NIDP)

9.38 The NIDS and NIDP described above is a pioneering approach to integrated planning, and the strategy and plan provided for vulnerability reduction and sustainable development. The bi-partisan consultative and participatory approach included a wide cross section of stakeholders and the product was expected to meet the needs and aspirations of the population over a ten-year period. NIDS provided a framework into which integration of disaster management could be effectively placed.

CDM Strategy and Results Framework

9.39 The BVI endorsed the Caribbean CDM Strategy and Results Framework, which sought to integrate CDM into the development planning process. The Draft Plan developed for the territory was adopted through a consultative workshop that included political, community and sector leaders. The Goal of the Framework was Reinforce the Development Potential of the BVI by reducing risks from all Hazards and the two Strategic Objectives included:

- 1 Reduce Economic Loss from Hazard Impacts
- 2 Minimise Human Suffering from Natural and Man-Made Hazards

9.40 The Results defined were six fold:

1. Mitigation tool including hazard assessments incorporated into development planning decisions
2. Improved/Enhanced institutional and human resource capacity to implement CDM
3. Improved construction standards for major infrastructure, critical facilities and housing stock
4. Recovery period from disaster impacts shortened
5. Increased citizen awareness and action
6. Improved efficiency of disaster response/relief efforts

Strategic Management Plan 2004-2008

9.41 The DDM Strategic Management Plan served to deepen and build on the provisions of the CDM Strategy adding another Objective and expanding the activities to achieve the strategic objectives. **Appendix III** presents the Strategy.

Capability Assessment of Key Agencies

9.42 Following the CDM Strategy, Capability Assessments of Key Agencies has been underway in the BVI as part of the institutional assessment necessary to guide capacity building for Disaster Management.

Knowledge and Information Base

9.43 Over the 20-year period 1983-2003 several studies and projects were undertaken and these have informed institutional building of the disaster reduction arrangements in the BVI. One of the significant studies/projects was the HRAP, completed in 1997 and described below. The project identified and assessed the hazards to which the BVI was exposed and recommended hazard mitigation strategies. The results of this project formed the centrepiece or hub around which program priorities were defined and many annual work programs were based. HRAP helped to shift thinking towards multi-hazard disaster reduction. It also influenced development of some of the important inter-institutional relationships that were required for hazard monitoring and warning, and the development of institutional capacities for early warning and island-wide communications required.

9.44 Some other studies and projects included:

- Review of the building process in the BVI
- Study of the disaster management capabilities of the British Overseas Territories,
- Capability assessments for readiness
- The impact of oil spills on the biological and socio-economic resources of the BVI
- A National Integrated Development Plan.
- Human vulnerability Assessment
- Poverty Assessment (undertaken through the Ministry of Health)

9.45 The BVI has over the years demonstrated its commitment to implementing the recommendations of such studies and projects, and also to implementing follow up programmes.

Capacity Building – Awareness

9.46 Significant importance has been attached to building awareness of disaster risk reduction in the BVI. Arrangements have been institutionalized at the level of laws, policy, in the national disaster management organizational structure, a post in the authorised establishment structure of the DDM, in work programs and in practice.

9.47 Legislatively it is provided that the Director of Disaster Management shall conduct programs of public information and education on the mitigation of, preparedness for, response to and recovery from, emergencies and disasters.

9.48 At the policy level, BVI has demonstrated that awareness is essential to inform and prompt the increased commitments to prevention and mitigation actions required from all parties in order to reduce the probability and severity of disaster events. It recognized that Government, the private sector and civil society all have roles in risk reduction. The BVI vision is to reduce risk and vulnerability to a minimum through the implementation of sound policies, practices and programs, and an associated policy priority is to ensure that the public is well-informed and educated about disasters, their consequences and preventive and mitigation measures.

9.49 The DDM has been given a specific function in relation to Public Information and Education, which is to provide the general public with education on the nature of hazards, protective measures, and an awareness of the responsibilities of government and citizens in an emergency/disaster. The DDM is also charged to provide accurate, timely and useful information and instructions to people at risk in the community during an emergency period.

9.50 At the highest advisory level within the national disaster management organizational structure i.e. the National Disaster Management Council, one of the institutional components is a Public Information and Education Sub-Committee. Within the DDM, which manages the day-to-day affairs, a post is authorised in its establishment structure for a Public Information and Education Officer.

9.51 The BVI DDM has a public information and education program that addresses hazard awareness through mass media and in the schools system at primary and secondary levels for both private and public schools as well as at the tertiary level. Programs and materials embrace the comprehensive disaster management paradigm. Information and education materials from the DDM have been incorporated into the geography curriculum at the secondary level and into the science and social studies curricula at the primary level. There is also a certificate level disaster

management course done at the Territory's Community College. In practice day-to-day liaison is established with the Territory's Department of Information and Public Relations.

9.52 The Territory has a high level of awareness of the hazards, and of the conventional requirements for preparedness and response. Although the DDM has had some difficulty retaining staff in the public education post, its program of work is effective in its reach across the islands. The "man in the street" has a high level of awareness of the high frequency hazards such as flooding, storms and hurricanes and also of some low frequency events such as seismic hazards. They know the authoritative sources for emergency related public information organizations, and often request and or invite the DDM to speak with their membership. In practice the program has had a high level of penetration in organizations in the public and private sectors and in civil society.

Capacity Building - Training

9.53 Training is one of the principal activities in the work program of the DDM. This is directed both at its own staff and members of the NEO as well as for key agencies, communities and the general public. The DDM is the primary agency arranging and or conducting disaster preparedness and response training. An annual program of training is prepared and approved for implementation and this is budgeted. Often such training is done with technical expertise from external sources and occasionally participants from other countries have participated. Participants are usually drawn from all sectors and agencies relevant to the particular courses including private sector and civil society organizations. As opportunities arise personnel of public departments and the DDM are provided external training. This training includes:

Basic Disaster Management	Incident Command Systems
Stress Management in Disasters	Damage and Needs Assessment
Supplies Management	Emergency Telecommunications
Basic Radio Operator	Mass Casualty Management
Mitigation Planning	Contingency Planning
Community Emergency Response	Shelter Management
Search and Rescue	Emergency Operations Centre
Warehouse Management	Logistics Operations
Basic EMT	

9.54 Regularly scheduled training programs have contributed to raising levels of awareness and understanding in the general public, and in public departments and agencies. Continuity and

progressive training for development of proficiency by individuals has been a significant challenge, as has been the retention of trained resources within particular public departments.

9.55 Arkansas Tech University (ATU) of Russellville, Arkansas and the H. Lavity Stoutt Community College are collaborating on the development of a Certificate of Achievement, Associate Degree, and Bachelor Degree in the area of Disaster Management. This collaboration includes the training of students in numerous areas of disaster management both at HLSCC and at ATU as well as allowing for a programme of student exchange.

Sector and Agency Plans

9.56 Several Ministries and agencies report having internal plans as stipulated by the Governor under the Disaster Management Act. However, Heads of these agencies often expressed reservation as to the standard of the plan and the level of proficiency of staff with the respective assigned responsibility. The DDM has occasionally conducted interagency training, but technical and human resources are limited.

9.57 The development of sector plans requires collaboration between the respective department/sector and the DDM, but again available resources have stymied progress in this area. As noted above, there are some 66 Ministries and agencies of government including six Ministries and the challenge of integrating risk reduction considerations require technical and human resources.

9.58 The health sector has been able after several years of sustained effort to institutionalize the post of Health Disaster coordinator and the post was filled in 2003. The Education sector has been working towards integration as well.

9.59 Of interest and note is the utilities sector. Between the 1970s and 1980s development in electricity, water and telephones ensured that conduits were built underground in order to reduce risk from wind forces. These have had positive outcomes and reduced impacts from successive wind hazards experienced on the island. Whereas neighbouring USVI has had disruptions to these services in storms and hurricanes, the BVI has had limited disruption as a result of the development choice to place conduits underground. (Roy Ward, Personal interview)

Technical

HRAP

9.60 The Hazard and Risk Assessment Project (HRAP) executed in the BVI 1995 -1997 was new to the Caribbean and to date has only been carried out by the BVI. The Project is considered a watershed in the development of disaster mitigation in the BVI and continues to be an important platform for the Disaster Mitigation Programme of the DDM. The HRAP, conceived by Jennifer Worrell whilst National Disaster Coordinator in 1993, sought to identify and prioritise the natural and technological hazards which affect the BVI, and to estimate the degree of damage that could result from elements of events of a given severity. Funding for the management of the Project was provided by the British Government through the Overseas Development Agency (ODA), and the Government of the BVI provided funds for the project activities. The project spanned a twenty- three month period with a total budget of US\$90,000. The project, coordinated by Aedan Earle, a consultant recruited from Jamaica, comprised three main components: hazard assessment, impact evaluation and the development of loss reduction recommendations.

9.61 There were four main activities:

- I. Hazard Mapping - included an assessment of Hurricanes, Terrestrial flooding, Seismicity and Landslides. Sample maps are included as **Appendix IV**.
- II. Production of an inventory of the elements at risk
- III. Vulnerability Analysis and Loss estimation
- IV. Development of Mitigation or loss reduction strategies

Approach to the Project

9.63 The HRAP was conducted as a series of sub-projects consisting of the four main activities outlined above. Each sub-project involved scientific studies, which were conducted by experts in the respective area. Activities were coordinated by the project manager, who was also responsible for the products of the various studies, and compilation of the final reports.

9.64 Local and overseas consultants carried out hazard mapping studies in collaboration with government agencies. Studies involved fieldwork, utilization of existing reports and baseline data, aerial photography, topographic and bathymetric maps, and digital databases.

9.65 The Geographic Information System (GIS) was selected as an appropriate platform for the project. Comprising a combination of computer software and hardware capable of capturing, storing, manipulating and presenting spatial information in the digital domain, this system therefore converted and transformed all information into digital maps. This digital domain enabled analysis and production of high quality hard copy maps.

9.66 Adoption of the GIS framework for the project therefore resulted in the creation of a digital database of spatial information. The presence of a central GIS in the Town and Country Planning Department (TCPD) of the BVI Government, meant that the data produced by the project could be easily used, stored, maintained and updated. The digital data also allowed for ease of electronic transfer via such media as the Internet. Hence the GIS framework shifted the project toward the production of information as a dynamic database of spatial data in digital format.

9.67 The GIS database was developed with the industry standard Arc Info GIS package. Data was digitized in AutoCad and the final datasets were finished and presented in ArcView. This software is also used by the TCPD. The TCPD GIS, which had been operational for a few years provided many essential datasets. The HRAP therefore also produced a GIS and a database, which could be utilized for disaster management and long-term development planning by the TCPD.

9.68 The ultimate aim of the project was to provide information, which could be used to mitigate potential losses from the occurrence of hazardous events. Agencies responsible for development planning and disaster management therefore have access to information to assist with decision- making toward loss reduction.

9.69 The project was guided by a Technical Advisory Committee (TAC), comprising Jennifer Worrell, Jeremy Collymore, and Keith Ford. The Project Manager, Donovan Gentles, who was then BVI's National Disaster Coordinator, served as Secretary to the Committee. The value of expert guidance was amply demonstrated through the work of these professional disaster managers. Throughout the course of the project a concerted effort was made to involve local agencies, and the project benefited from considerable assistance from the Departments of Town and Country Planning, Conservation and Fisheries, Public Works, Water and Sewerage, Agriculture and Survey. (After report to ISDR/Kobe, 2005)

Quantitative Risk Assessment Project (QRAP)

9.70 This project, to be completed in 2005, is a pilot funded by CDERA under the CADM project. It is intended to establish a Geographic Information System (GIS) model that will provide outputs to quantify financial losses that could be expected from a given hazard scenario. Local training and involvement is integral to this project, which will include systematic updates.

9.71 The general objectives of the QRAP are intended to:

- a. Provide probabilistic risk maps for all hazards/sub-hazards and building vulnerability assessments
- b. Streamline existing hazard information into a consistent digital format that is GIS - friendly
- c. Create economic impact models and provide cost benefit analysis for mitigation strategies
- d. Characterize critical infrastructure
- e. Map and characterize alluvium and “made-ground”
- f. Map landslide occurrence and potential
- g. Provide tsunami modeling
- h. Provide an assessment of the impact of natural hazards
- i. Provide involvement and on-the-job training for the GIS-based Quantitative Risk Assessment Process
- j. Satisfy the applicable requirements in the approved Mitigation Planning Framework

9.72 Key Government agencies such as Disaster Management, Town and Country Planning, Survey, and Public Works are expected to use the results of the hazard assessment.

Building Regulations

9.73 The Building Regulations (1999) placed emphasis on the development of building standards, which would prevent or mitigate damage arising from natural hazards. The Regulations provided administrative and enforcement mechanisms relating to building practices, and the use of acceptable materials and building systems. However, widespread non-compliance with these regulations prompted inclusion of stricter requirements under *Building Regulations and Land & Infrastructure Development Guidelines* in the *Disaster Mitigation Strategy*. The DDM subsequently commissioned an assessment of the ***Development and Building Review Process of the British Virgin Islands***. The findings will be used to strengthen the building requirements.

Climate Change Adaptation

9.74 Several studies have been undertaken in the Caribbean under the CPACC, MACC and ACCC projects. Data can be used as reference guides for adaptation planning in the BVI, but no discrete activities labelled climate change adaptation is under active consideration. The HRAP and QRAP projects will provide hazard and risk identification, and vulnerability assessments to inform the process.

Public Outreach/Programmes

Early Warning System

9.75 The Territory has recognized that early warning systems (EWS) are a critical component of an effective disaster management system. Provision for EWS has been made in legislation, in policy, in the day-to-day programs of the DDM and in its external relationships. Significant emphasis has been placed on the communication facilities for effective delivery and dissemination of early warning.

9.76 The Disaster Management Act 2003 mandates that there shall be a National Alert System for the Territory and that it shall be operated under the supervision of the Director of the DDM. The system comprises a National Emergency Broadcast System and a National Siren System. The two systems are complementary and have the capacity of indicating an alert throughout the island chain. Emergency warnings are capable of being disseminated through radio and cable television stations automatically from the DDM on order of the Director. MOUs have also been established between the stations and the DDM. Government has committed itself at the policy level to ensuring:

1. An effective national emergency alert system management strategy is established and implemented.
2. Broadcasting licenses contain conditions for mandatory participation of stations in the national emergency alert system.
3. Coordination of the national emergency alert system at various levels of government.

9.77 The DDM has been assigned the specific function for establishing, using, maintaining, augmenting and providing back up for all types of communication devices required for emergency and response operations. The building of the legislatively mandated system is a work in progress and has been an integral part of the DDM work program for several years.

9.78 The National Emergency Operations Centre (NEOC) is now equipped with primary and alternative communications systems which are tested and maintained on a regular basis by an officer assigned to the post of Telecommunications Officer in the DDM. The NEOC, which is located at the offices of the DDM, has standby generator and batteries for emergency power, and radio transmitters located throughout the Territory are similarly equipped. Frequency Use Procedures have been developed, and DDM staff, as well as volunteers of the Disaster Auxiliary Corps (DAC), have been trained as radio operators. The latter assist on a daily basis as well as during emergencies.

9.79 In addition to regular landline phones and radios, extensive use is made of cell phones and procedures are in place for use of runners if required. A small amateur radio group exists and is available to assist as required. The Territory is able to communicate externally through redundant communications systems and several satellite phones are available at different locations such as in the NEOC, Governor's residence, and from sister islands. Relationships have been established with the nearby U.S. Virgin Islands Territorial Emergency Management Agency (VITEMA) to assist with communications if needed in emergencies.

9.80 In-Territory capacity for hazard monitoring is neither extensive nor robust. The Territory has neither the skilled human resources nor the specialized agencies with the capacities required to routinely monitor, study, analyze and define threats associated with the several hazards to which the Territory is at risk. The DDM itself does some weather related hazards monitoring particularly in the "hurricane season" and in collaboration with other Government Departments some monitoring of other hazards. Weather monitoring services are contracted and are also provided by the met-services for the BVI located in Antigua. Seismic monitoring is provided through formal and working relationships developed with institutions such as the Puerto Rico Seismic Network and the University of the West Indies Seismic Research Unit in Trinidad.

9.81 Alerting and notifying of key persons are done by the NEOC, and data is constantly updated and kept in prescribed places and databases. The NEOC does not operate on a 24-hour basis except in emergencies. It operates on the regular 8-hour workday of the island. Alternative arrangements are in place for handling "out-of-hour" alarms. Alerting and notifying of the general public is undertaken following consultation and is usually done as duly ordered using the communications means described above.

During emergencies the Chief Information Officer of the island operates from the NEOC and is the official spokesperson for the National Disaster Management Council. The Public Information

and Education Officer of the DDM assists him. Relationships and procedures are continually being strengthened between these offices.

9.82 Public Service Announcements (PSAs) and advisories have been pre-prepared for high-frequency hazard events and are available for quick dissemination. Plans are in train to have appropriate PSAs for other hazards similarly prepared and available.

9.83 Through training and mass media publications the general public has been conditioned to the authoritative sources of emergency related information and advisories.

Volunteer Corps

9.84 National Authorities in the BVI generally recognize that geographical size and small populations on each of the inhabited islands makes it imperative that mechanisms to utilize all available manpower resources in times of emergency be institutionalized and sustained. Institutional arrangements for the use of volunteers are provided for in the Disaster Management Act 2003, in the National Disaster Management Policy and in the authorised establishment structures of the DDM.

9.85 The National Disaster Management Plan includes “procedures for accepting and facilitating the distribution of volunteer services and relief supplies during a threatened hazard alert...or in the event or aftermath of a disaster emergency”.

9.86 The BVI DDM established a Disaster Auxiliary Corps (DAC) in 1995. Although over the years its fortunes have fluctuated it forms an important institutional component of the DDM. The establishment is 25 Volunteers, and this is fully subscribed. DAC Volunteers are involved in the routine activities of the DDM and provide support during both normal and emergency periods. They are often the beneficiary of disaster related training and serve in the National Emergency Operations Centre (NEOC) during emergencies.

9.87 Other volunteer organizations and organized volunteers form a part of the institutional arrangements for emergency and disaster management in the BVI. Some have a visible, well-known and long track record while others, quietly but equally formidable in their support, form part of the network of support agencies available to address various sectors and areas affected in an emergency. These include organizations in public, private and non-government sectors such as: Red Cross, Rotary, VISAR, Auxiliary Firemen, Hotel and Tourism organizations and Chamber of Commerce among others. They are usually incorporated into and form part of the organizational

structure of the National Disaster Management Council (NDMC) or are part of the DDM. In addition, other institutions or members thereof will volunteer in times of emergency.

9.88 Some concern has been expressed over the degree of willingness of residents to volunteer in normal times and of the ability of some volunteer organizations to attract volunteers. Despite this, actual events indicate a strong spirit of volunteerism still exists and it emerges especially in times of emergency. In recent times, persons contributing their labour free of cost to response and recovery have come to expect some form of compensation to recover costs where they contribute equipment or transport.

9.89 The BVI hosts a significant number of migrant workers (“non-belongers”) as part of its population. Many contribute and provide support through their places of employment in both the private and public sectors and in their associations and volunteer organizations and clubs. It may be useful to note that the legislation is very inclusive in its scope and addresses residents. No distinction is made between nationals and non-nationals.

9.90 Government’s current policy is crafted in similar language and recognizes the necessity of having active participation of community organizations. It expresses a commitment to “support and maintain the necessary administrative arrangements to allow for the full participation of residents in DM activities through their organizations and representatives”. The government has specifically undertaken to support the disaster management related activities of all service organizations, allocate resources to assist in the further development of the DAC, pay special attention to the development of community capacity in the sister islands and to promote a spirit of mutual support among residents throughout the Territory.

9.91 The DAC has formed and continues to form a strong component of support to the DDM. Although many of the other volunteer organizations and organized volunteers contribute, their contribution is often responsive in nature and made post disaster or in the face of imminent emergency. While their raison d’etre may not be primarily disaster related, several have emergency preparedness on their agendas. The DDM is making concerted efforts through media awareness, discussion fora, meetings and training, to shift thinking and agendas towards risk reduction. Volunteerism is an integral part of the arrangements in the BVI and their role and importance are recognized. Systems for making use of volunteers and volunteer organizations have been built and institutionalized at the level of laws, policy, organizational establishment and in practice.

Community Development and Civil Society

9.92 Ten zonal committees, which represent the local communities across the BVI, are part of the organizational structure for disaster management in the territory. They work with the DDM to disseminate information to the communities, and to manage community disaster management facilities/resources such as shelters. Committee members have formal training in hazard awareness, and can access hazard maps from the offices of the DDM. Communities are generally aware of their vulnerabilities. The BVI's disaster management structure is facilitating community resilience building through training and provision of resources. Volunteers also play an important role, and the legislation and policy support their involvement.

9.93 The government has specifically undertaken to support the disaster management related activities of all service organizations, to allocate resources for the development of community capacity in the sister islands, and to promote mutual support among community residents throughout the Territory.

PART IV. THE BVI AND THE PARADIGM – A COMPARISON

This paradigm was outlined and discussed in Section 5 Part II. The categories listed in the matrix below summarise the key issues, and the components elaborate on the main elements of each category. Rating is based on a scale of 1-5, with 5 being the highest rating. Scores were assigned based on a qualitative assessment of the evidence gleaned from the study.

Category	Component	Rating	Comment
Policy	National and sectoral policies for disaster risk management	4	Disaster Management Policy, Hazard Mitigation Policy and Health sector policy established. Education and Works underway. Other sectoral policies to be developed.
Strategy	Strategic programme of action for mainstreaming disaster risk management	4	National Integrated Development Strategy and Plan – altered with change of administration in 2003. CDM Strategy accepted. Plan of action developed and being implemented.
Leadership	Understanding and acceptance by policy-makers of the importance of disaster risk management to economic, social and environmental viability (sustainable development) Strong leadership at the national governmental level – a Champion	3 5	General understanding but still some conflict with land use and economic development initiatives. Champion at level of Deputy Governor made significant difference to development of National Disaster Organisation, policy and strategic direction.
Hazard and Vulnerability Information	Acquiring scientific knowledge of natural and technological hazards at the selected geographic location Knowledge and assessment of the patterns of land and livelihood that may be exposed to the respective hazards - physical, ecological, economic and social vulnerability assessment	5 3	HRAP and QRAP are models worthy of replication. Other mapping and vulnerability assessments have been undertaken through the DDM. Ecological and economic vulnerability need to be developed. Some progress in physical and social vulnerability assessment has been made.

Category	Component	Rating	Comment
Knowledge and skills	Education and awareness programmes that elaborate the relevant hazards and related risks, provide skills, and allow for understanding and application of the appropriate measures to minimise social and economic loss and dislocation	4	Tertiary level program introduced at Community College. Overseas training programs available. Public education programs delivered through print and electronic media. Schools programs.
Institutional Capacity	Assessment and strengthening of institutional capacity – all related agencies, organizations and institutions should include disaster risk management in planning and operations and should be able to extend the concept to related constituencies – management, staff and “customers”.	2	Strengthening of capacity throughout government needed. Dept of DM has strong program, but other agencies need to be developed to facilitate mainstreaming
Project cycle & Programming	Integration of disaster risk management with the Environmental Impact Assessment Process and with the project cycle.	3	EIA process incorporates disaster risk consideration, but integration with project cycle yet to be developed
	Incorporation of disaster risk management in donor programs	4	DFID is Agency of note and disaster management is integral to their programming.
	Incorporation of disaster risk management in key economic sectors including finance and insurance	2	Limited evidence of integration. Considerable room for growth
Legislation	Disaster management legislation enacted and promulgated	5	Legislative framework well-developed
	Incorporation of disaster risk management in planning legislation	5	
Disaster plans	National and sectoral Disaster plans developed, reviewed and tested on a schedule	3	National plans well developed. Health and Education sector plans developed. Tourism sector underway. All sectors need plans
	Emergency operations procedures and facilities established	4	DDM well situated and equipped. On-going

Category	Component	Rating	Comment
			program of development
Disaster Risk Reduction	Protection of critical infrastructure and lifelines with appropriate mitigation measures	3	Still a work in progress. Policy-makers sometimes in development conflict
	Risk reduction measures included in response, rehabilitation and recovery	2	Limited evidence demonstrated
Community Based Involvement	Volunteer activity integrated into DM	4	Disaster Auxiliary Corps (DAC) established & integrated Institutional arrangements for the use of volunteers provided for in the Disaster Management Act 2003, in the National Disaster Management Policy and in the authorised establishment structures of the DDM.
	CBOs and NGOs involved in all stages of DM cycle		
	Community awareness programs towards building community resilience	3	Zonal committess established, Receive training in hazard assessment and mitigation. Disseminate information within communities
Private Sector Involvement	Private enterprise consulted on policy and programs	3	National Disaster Organisation includes representation from private sector entities Play role in volunteer sector
	Disaster management integrated into private development projects	1	No evidence demonstrated

PART V.

SUMMARY OBSERVATIONS AND RECOMMENDATIONS **LESSONS FOR SMALL ISLAND DEVELOPING STATES (SIDS)**

10.0 ACHIEVEMENTS

Development of the BVI Disaster Management Agenda has provided some useful approaches that can be replicated in other SIDS, and indeed in areas seeking to strengthen disaster risk reduction through integration into development planning. The value of a targeted communications and education strategy, a high level champion, and a legislative, policy and institutional framework has been clearly demonstrated. Comprehensive strategic planning provides a driving and organising structure. The National Disaster Organisation has developed well over the twenty-year period and integration of disaster risk reduction has begun in some sectors. Achievements in the BVI point to the value of a structured and results-based process executed over a defined period.

Risk Awareness and Assessment

10.1 The British Virgin Islands has undertaken extensive Hazard mapping, vulnerability and risk assessments and have established the mechanisms for integrating these into the development approval process. Efforts to strengthen adherence to environmental guidelines and planning regulations are underway. Risk assessment is fundamental to disaster risk reduction and therefore the BVI experience in this regard should be replicated in other territories of the Caribbean and indeed of Small Island Developing States (SIDS).

Knowledge Development – Education and Training

10.2 The disaster management programme at the Community College exhibits response to needs of the territory as well as the value of partnerships for technical and professional exchange. The potential for human resource capacity building is being greatly enhanced.

10.3 Regional and international training programmes have also been effectively used by the BVI government to strengthen resources in the territory, and to build networks of technical linkages.

Institutional Frameworks

10.4 The growth and development of the Department of Disaster Management has been purposefully promoted and the focus on vulnerability reduction of the territory has been integrated in this work. Linkages with other agencies of government, the private sector and civil society is a

work in progress and continuing work with strategic planning and implementation of project objectives is encouraging. The BVI case exemplifies the significance and value of an appropriate institutional framework to drive the process of disaster risk reduction. The need for a high level champion is a significant lesson, as is the value of regional and international collaboration and networks.

Policy – Disaster Management, National Integrated Development, National Disaster Mitigation

10.5 The National Integrated Development Strategy was a pioneering initiative by the Government of the BVI and the integration of vulnerability reduction proved a significant milestone in conceptual thinking. The consultative and participatory process sought to enable continuity between regimes of government as the process included both government and opposition parties and a wide array of stakeholders. The Disaster Management Policy and the National Hazard Mitigation Policy have provided more recent frameworks for strategic planning and have built on preceding initiatives. Continuity is a significant lesson and the value of deepening and strengthening foundation projects and programmes redound to the benefit of the overall goals and strategic objectives. Policy statements serve as useful guidance documents for the BVI.

Legislative and Regulatory Framework

10.6 Legislative and regulatory procedures are essential to guide and to enable enforcement. The BVI has sought to put in place the Disaster Management Act, which makes provision for disaster risk reduction steps. Agencies are mandated to develop plans which can in turn provide the vehicle for integrating risk reduction programmes. Preparedness and Response Plans are effective instruments for reducing impact and can provide the plank for building effective recovery strategies to incorporate risk reduction. The recently enacted Physical Planning Act also takes account of the need for environmental management and vulnerability reduction.

Environmental Management – Permitting

10.7 The Environmental Assessment Process helps to guide development approvals and the Fisheries and Conservation Department, which has primary responsibility, is the “watchdog” agency. Sensitivity to risk reduction is evident in this Agency’s operations and the proposed Environment and Planning Agency will provide the framework for fuller integration of risk reduction principles as they relate to sound environmental management and sustainable development.

Early Warning

10.8 An early warning system has been facilitated by plans, state of the art technology and training of technicians, and support of the media. Community involvement through the DAC, zonal committees and the media is assisting the strengthening of this program. Challenges from the multi-island territory are being assisted by focal points and equipment on each inhabited island.

Application of Technology

10.9 The HRAP is a significant milestone. The recently started QRAP will augment the output and utility of the risk assessments for integrated planning purposes. Telecommunications planning and infrastructure development have together embraced state of the art technology which has greatly enhanced early warning, data generation, management and utility. Technology application is essential to integration of disaster risk reduction into development planning and sustainable development initiatives.

Contingency Fund and Insurance

10.10 Government has a disaster contingency fund into which ½% to 1% of revenue is deposited annually for use in the event of a disaster. The fund has been in existence for the past 5 years and currently stands at approximate US\$700,000. Private sector businesses are not required by law to set aside contingency disaster funding. Some major companies operate a form of self insurance (captive Insurance), which consists of a non-taxable fund into which money that would otherwise have been used to pay insurance premiums is deposited. The fund can only be used for disaster related expenses. (OAS, 2002)

Areas for Further Strengthening

Land Use Planning

10.11 Approval has been given to developments that contravene sound planning and environmental sustainability. It is anticipated that enforcement of the Physical Planning Act through incentives as well as penalties will help to facilitate observance of the Government's articulated commitment to vulnerability reduction and sound environmental management.

Financial Instruments

10.12 Consideration of appropriate financial instruments to further vulnerability and risk reduction should be placed on the agenda of the Development Planning Unit and the Minister of Finance. Risk transfer is an important aspect of risk management, and incentives often generate goodwill and support for regulatory measures. Insurance companies should be encouraged to

provide incentives for use of risk reduction measures such as safe building and integration of hazard information into site selection and design.

Sector/Agency Plans

10.13 Business Continuity Planning is essential for all sectors in government and private sector. This area needs to be developed

Recovery Procedures

10.14 Recovery guidelines to reduce the probability of rebuilding risk have been receiving increasing attention. The BVI programme will need to address these as part of strengthening the Disaster Risk reduction/Comprehensive Disaster Management framework.

Climate Change Adaptation

10.15 This area of work is to be further strengthened and as the Caribbean program extends its reach it is expected that greater support will be given to adaptation measures in the BVI. DFID has been conducting research on the impact of climate change on UK overseas territories, but no distinctive project has been identified for the BVI.

Documentation of Economic and Financial Benefits

10.16 The return on disaster management investment in terms of reduced impact could not be quantified at this point. A system to document savings from risk reduction initiatives should be designed and implemented.

Strengthened Role for the Private Sector

10.17 Selected agencies of the private sector are currently represented on the NDMC, and the sector is engaged with volunteer activity during periods of crisis. However, the overall level of involvement of the private sector in disaster management is currently low. Development initiatives need to integrate assessment of ecological as well as natural hazard impact into investment analysis and decision-making. Inadequate use is made of the hazard information available through the relevant government departments. The government should work through the Chamber of Commerce, Rotary Club and "trade associations " to engender awareness of the value of disaster management to risk reduction. The Insurance sector has an important role to play and should be brought into the framework.

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PART VII – PERSONS CONSULTED

Mr. Thomas Macan, Governor of the BVI

Mrs. Dancia Penn, Deputy Governor of the BVI

Mr. Glenroy Forbes - Financial Secretary, Ministry of Finance

Ms Sharlene DaBreo, Director, Department of Disaster Management (DDM)

Mr. Keith Dawson, PR Manager, Tourist Board

Mr. Gall - Deputy Chairman of the Financial Services Commission

Mr. Robert and Mrs. Violet Gall – Representatives of the Chambers of Commerce and Hotel Association

Mr. Donovan Gentles, Past Disaster Coordinator, BVI

Mr. Ray George – Managing Director, BVI Ports Authority

Mr. Elton Georges, Former Deputy Governor of the BVI (Retired)

Dr Drexel Glasgow, Deputy Director, Public Works

Mr. Russell Harrigan, Director Strategic Planning, Tourist Board

Mr. Bertrand Lettson – Director Conservation and Fisheries

Mr. Otto O’Neal – Director, Development Planning Unit

Rev Edris O’Neal, Head of the Red Cross in BVI

Dr. Irad Potter – Department of Health

Mr. Louis Potter, Public Sector Reform Programme

Mr. Leando Stoutt, Commissioner, Fire Dept

Mr. Arthur Swain (now deceased). Telecommunications expert, DDM

Mr. Roy Ward, Past Disaster Coordinator, BVI

Ms. Sandra Ward – Director of Communications, Chief Minister’s Office

Ms Jennifer Worrell, Past Disaster Coordinator, BVI

PART VIII - APPENDICES

Appendix I	Terms of Reference
Appendix II	CDM Strategy and Results Framework - CDERA Member Countries
Appendix III	Draft CDM Strategy - BVI
Appendix IV	HRAP SAMPLE MAPS

APPENDIX I



UNITED NATIONS DEVELOPMENT PROGRAMME CARIBBEAN RISK MANAGEMENT INITIATIVE

BEST PRACTICE CASE STUDY

TERMS OF REFERENCE

Draft

1.0 Background

In September 2001, UNDP's Bureau for Crisis Prevention and Recovery (BCPR) and the Regional Bureau for Latin America and the Caribbean (RBLAC) initiated a Preparatory Assistance (PA) called Havana Risk. The PA was a consultative process involving governments, regional and international organizations, NGOs, private sectors and other key stakeholders in the Caribbean, with the objective of managing and reducing the risks associated with natural, environmental and technological hazards – particularly within the larger context of global climate change. The PA called for an innovative range of activities to be undertaken at the regional level in order to formulate a Caribbean Risk Management Initiative (CRMI).

The CRMI was formally launched in Barbados in February 2004. The CRMI is designed to build capacity within the Caribbean Region to adequately address the growing occurrence of natural hazards and environmental risks as well as to emphasize the concept of climate change and social vulnerability. The activities for the Initiative will be implemented via the UNDP's offices in Cuba, Barbados and Jamaica.

The outputs of the Initiative are;

- 1.1 Integrated cross-cultural risk management and adaptation knowledge networks developed;
- 1.2 Cadre of climate risk management personnel developed;
- 1.3 Policies, institutional structures and legislative systems developed and strengthened;
- 1.4 Risk reduction and climate change adaptation tools developed and applied;
- 1.5 Increased resources for climate risk reduction projects, and
- 1.6 Partnerships established and strengthened.

The cumulative goal of the activities for the Initiative is to strengthen disaster and risk management activities within the Caribbean region.

One of the activities scheduled for the UNDP's office in Barbados is to document a best practice case study. This study as stated in the Initiative's Project Document, is to demonstrate "how one SIDS (Small Island Developing State) country has integrated risk reduction into its development agenda and how

investment in risk reduction as well as traditional preparedness and strengthening of the disaster management institution has contributed to reduce damage from recent natural hazards such as hurricanes, thereby contributing to reducing the loss of development gains.”

The best practice case study will make a significant contribution to the knowledge base of risk reduction for Small Island Developing States (SIDS), both in the Caribbean Region as well as globally. The knowledge will be of particular importance to the Caribbean since their relatively small size, high population growths, narrowly based economies and relative isolation, amongst other characteristics, enhances their vulnerability to a wide range of natural and technological hazards – hurricanes, earth quakes, floods, droughts, oils and chemical spills, etc. Therefore, a single event can devastate a SIDS economy.

Given the precarious nature of hazards, risk reduction and disaster management issues should be given a prominent role in all SIDS development agenda. One SIDS that has been cognizant of this approach is the British Virgin Islands (BVI). Hence, the best practice case study will document the Disaster Management Programme in the BVI, noting how they integrated risk reduction into their development agenda and illustrating how the islands have gained in the long term from investing in such initiatives.

Since 1983, the BVI Disaster Management Programme has come to be recognized as a model for small island states in the Caribbean Region. In 1990, the government of the BVI took the first major step towards securing a less vulnerable future. They appointed a full time disaster preparedness coordinator and a disaster preparedness officer. The second major step came in 1993, with the establishment of a national disaster management agency called the Office of Disaster Preparedness (ODP). The ODP was subsequently renamed the Department of Disaster Management (DDM) in 2002.

The case study will document the successes and challenges faced by the BVI over the past 20 years and will serve as a benchmark for SIDS in the region as well as provide an example of how investment in risk reduction as well as traditional preparedness and strengthening of the disaster management institution can contribute to reduced damage from natural hazards and sustained development.

The UNDP is seeking a consultant to conduct this Best Practice Case Study. Interested consultants are expected to submit a suitable proposal to the UNDP based on these terms of reference.

2.0 Objectives of Study

- 2.1 To document a Best Practice Case Study that integrates risk reduction into the development agenda.
- 2.2 To utilize the findings and recommendations to contribute as an alternative

practice for other SIDS.

3.0 General Responsibilities

- 3.1 To develop a paradigm for a best practice that integrates risk management into a country's development agenda.
- 3.2 To document the integration of risk management into the development agenda of the BVI.
- 3.3 To compare the paradigm developed to the BVI's case study and make conclusions and plausible recommendations.

Specific Responsibilities

To suggest a definition of the concept of integration of risk management into the development agenda for the purpose of this study.

To design and describe a paradigm of risk management integrated into the development agenda. The paradigm should include, but not be limited to, the following components:

Disaster Management Information

- Hazard identification,
- Vulnerability assessment,
- Response capacity evaluation,
- Risk assessment,
- Disaster scenario design.

Prevention/Mitigation

- Legislation/Regulations,
- Policies and Plans,
- Organizations,
- Retrofitting/ Maintenance,
- Structural changes,
- Re-location,
- Land development,
- Land use,
- Physical planning,
- Law enforcement,

Preparedness

- Legislation,
- Policies,

- Organizations,
- Facilities,
- Equipment,
- Planning (emergency and recovery),
- Training,
- Simulation exercises,
- Education and public awareness.

Consultants should determine sub components for the above general components to determine the most effective approach to integrate risk management into a country's development agenda. Once this has been developed it will be helpful to the consultants as a checklist for the documenting the BVI's Disaster Management Programme. Examples of sub components include:

For Disaster Management Information: -

Hazard Identification

Existence of documentation of history of hazard's impacts, consequences and costs in the BVI.

Existence and use of a list of hazards the BVI are prone to. This includes both natural and anthropogenic hazards, etc.

Vulnerability Assessment

Identification/mapping in the BVI of vulnerable areas to the hazards identified.

Update maps and use maps in the BVI for planning and development processes, etc.

For Prevention/Mitigation: -

Legislation/Regulations

To have a building code enacted.

Land development legislation enacted that considers adequate development in vulnerability areas identifies, etc.

Policies and Plans

To have mitigation and development policies and plans that consider reduction of risks and vulnerability involving all stakeholders, etc.

For Preparedness:

Planning

To have emergency response plans for all the hazards identified in the BVI according to priorities, both natural and anthropogenic.

To have permanent planning processes for revision, updating and testing for each of the plans through.

Involvement of all stakeholders in the planning process.

Training

To train response personnel in their tasks considered in the emergency response plans according to their responsibilities and needs.

To have a permanently revised and updated disaster management training programme that identifies needs and type and number of personnel required for training. The training programme should establish the type of training courses and dates/frequency of delivery.

Etcetera.

To document the integration of risk management into the development agenda of the BVI:

- For each of the sub components developed for the paradigm, determine their characteristics, tasks/activities, partners or stakeholders that led to its implementation in the BVI. Document the results, impacts, costs and effectiveness in terms of risk reduction. Substantiate assertions and ensure accuracy of all information gathered for documentation. Crosschecking of information in order to ensure accuracy will be key.
- Speak with stakeholders that participated in the Disaster Management Programme and in the integration of risk reduction in the BVI's development agenda, starting with the National Disaster Coordinator. Other stakeholders may include professionals from ministries and other governmental, private and social organisations. Contact project managers for the projects that were undertaken to implement the BVI's Disaster Management Programme if necessary. Determine what sectors were involved, what were their roles and what data did they use to perform their functions. What did the data indicate? What changes in the development agenda were implemented due to the findings? Some key elements to be highlighted could include:
 - Innovative approaches
 - Cost-effectiveness
 - Challenges and responses
- Obtain baseline information on the main natural hazards that the BVI are prone to. Identify their characteristics, impacts, consequences, costs, recovery, etc.
- Obtain information on the plans, policies, legislation, frameworks and projects for mitigation, development, recovery, environment, etc. Determine how they were implemented, where they were implemented and why they were implemented. Evaluate the effectiveness of the plans, legislations and frameworks that were implemented.

- Obtain relevant documents on tools and methodologies used for the Disaster Management Programme and risk reduction in the BVI. This includes vulnerability assessments, models, scenarios, field surveys, GIS databases, disaster management database, key inventories of response materials and equipment/emergency supplies estimation, estimation of risks and published documents on previous assessments relating to disaster preparedness and risk reduction. What information was used as the baseline? What were the findings? How was the findings incorporated into the development agenda? How effective was the changes in reducing risks? Etcetera.
- Obtain information on the costs for implementing the risk reduction and disaster management strategies into the BVI's development agenda. Estimate where possible, the costs for projects, materials, and personnel and for introducing other risk reduction activities into the development agenda. What were the sources of funds, and what are the emergency funds? Compare the costs of these activities to the costs of the hazard's impacts and consequences and develop conclusions.
- Since the objective is to document a best practice case study, there is need to assess the effectiveness of the strategies that were implemented in the BVI. This requires documentation of the hazard or hazards that has/have impacted the islands after the implementation of the risk reduction and disaster management activities. Data needs include – magnitude of hazard, type of hazard, social impacts, economic losses etc. From this, evaluate the effectiveness of the mitigation and preparedness tools and project activities that were used in the BVI's Disaster Management Programme
- Assess the impacts of recent hazard (s) by comparing it to the impacts of previous hazards of similar characteristics in order to evaluate the effectiveness of the strategies outlined in BVI's Disaster Management Programme and of the integration of risk management into the development agenda.
- Obtain information about the BVI Hazard and Risk Assessment Project and note the suggested recommendations on mitigation, planning, development, etc. and determine what has been implemented and evaluate the usefulness of the recommendations before, during and after the hazard.
- For the documentation aspect of the study. Consultants should;
 - Ensure that the case study utilizes much of the same conceptualization and vocabulary common to the target audience, which includes government officers, disaster managers and planners.
 - Present clear, coherent drafts for editing as per previously agreed time frame and deadlines.
 - Re-draft the document incorporating editorial comments
 - Submit a final draft ready for publication

- When applicable, follow suggested formats for drafting and presenting reports as laid out by UNDP.

Tasks.

Task 1. To develop a paradigm of a best practice for integrating risk management into development agenda.

Task 2. To Document the best practice of the BVI in integrating risk reduction into the development agenda according to the paradigm developed in task 1.

Task 3. To compare the best practice case study with the paradigm developed and make recommendations to improve the integration of risk reduction in the development agenda of the BVI and other Caribbean countries.

Deliverables.

A paradigm that illustrates how risk management should be integrated into the development agenda for SIDS.

Final report comparing the Best Practice Case Study to the paradigm developed and including recommendations.

Duration of Project.

The duration of this project will be four months.

Reports and Time Schedule.

The selected consultant is required to produce three reports:

Inception report – to be submitted within the first 2 weeks of the study. The report should outline the tasks/activities, outcomes, costs and time frame for tasks/activities. This report should include a definition and paradigm for integrating risk reduction in the development agenda.

Mid Term Report – this report should detail the progress of the scheduled activities and any changes, problems and/or complaints experienced thus far in the study.

Final Report – to be submitted at the end of the contract fulfilling all of the tasks outlined in these Terms of Reference.

Qualifications.

The consultant (s)/consulting firm that will apply this proposal must have a combination of experience in the following fields:

Disaster management

Project Management

Risk reduction

Climate Change

Development

Interested applicants should have experience in similar projects and should have at least ten (10) years of working experience at least one of the fields described above. Interested Consultants are also expected to be knowledgeable of the Caribbean Region.

Proposal

A proposal including the description of the activities that the consultant will execute should be sent to the UNDP's office in Barbados. The proposal must include a description of all activities, personnel, materials and equipment and other items such as travel/per diem that will be involved in each task, the cost per item/task and the total cost for the study. The proposal should be accompanied with the Consultant(s)/Consulting Firm's Curriculum (a) Vitae (arum). The proposal will be analyzed and the project will be awarded according to UNDP's regulations.

APPENDIX II. CARIBBEAN CDM STRATEGY AND RESULTS FRAMEWORK

CDERA MEMBER COUNTRIES

Goal: Sustainable Development in the Caribbean region

SO: Comprehensive Disaster Management is integrated into the development processes of CDERA member countries.

IR-1: Stronger regional and national institutions promote CDM.

IR-2: Research and training support CDM.

IR-3: Regional institutions and donors incorporate CDM in their own programs and promote CDM to their national members/clients.

IR-4: Preparedness, response and mitigation capability is enhanced and integrated.

IR-5: Hazard information is incorporated into development planning and decision – Making

CDERA MEMBER COUNTRIES

Antigua and Barbuda

Anguilla

Barbados

Belize

British Virgin Islands

Dominica

Grenada

Guyana

Jamaica

Montserrat

Saint Lucia

St Kitts and Nevis

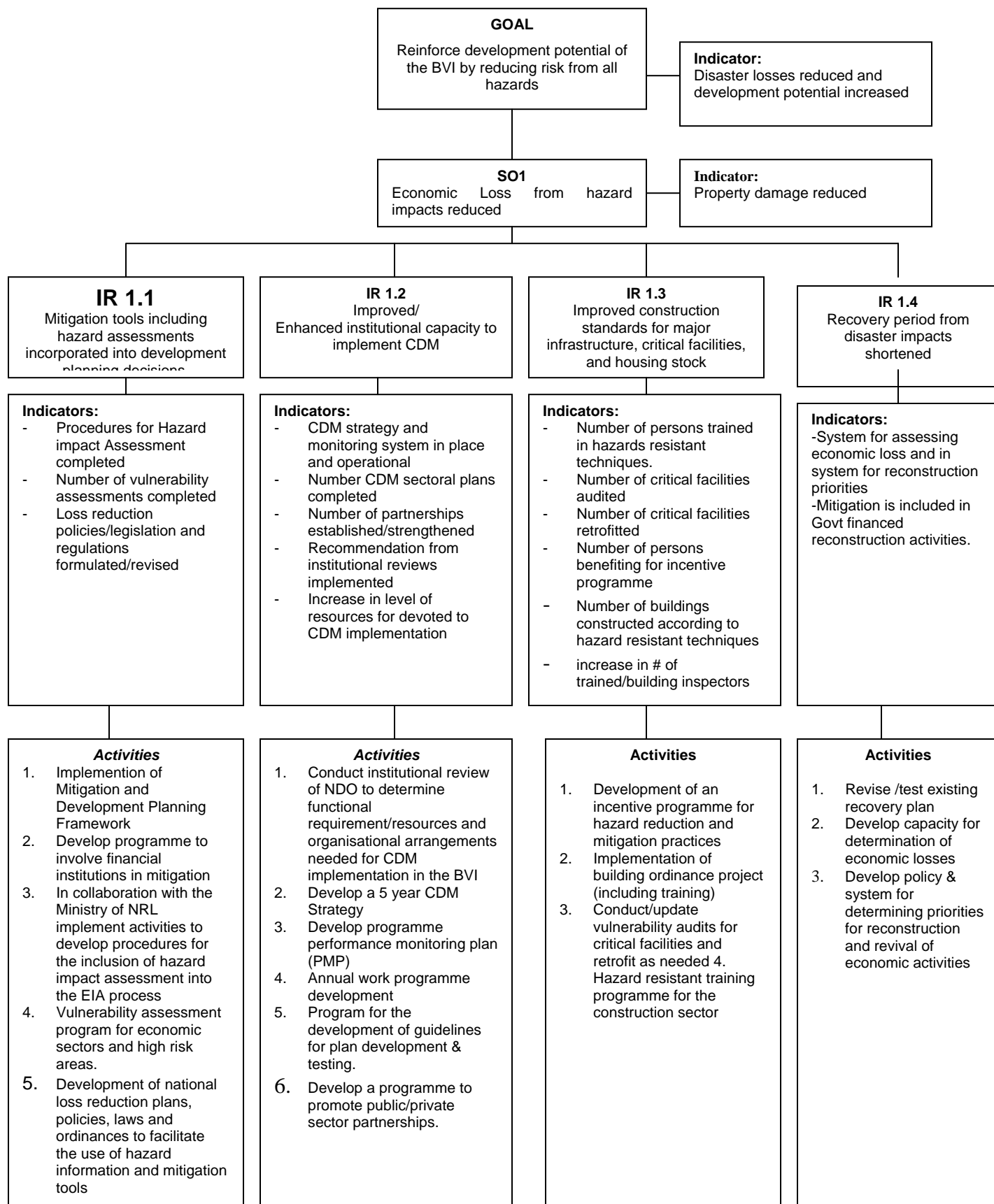
St Vincent and the Grenadines

Trinidad and Tobago

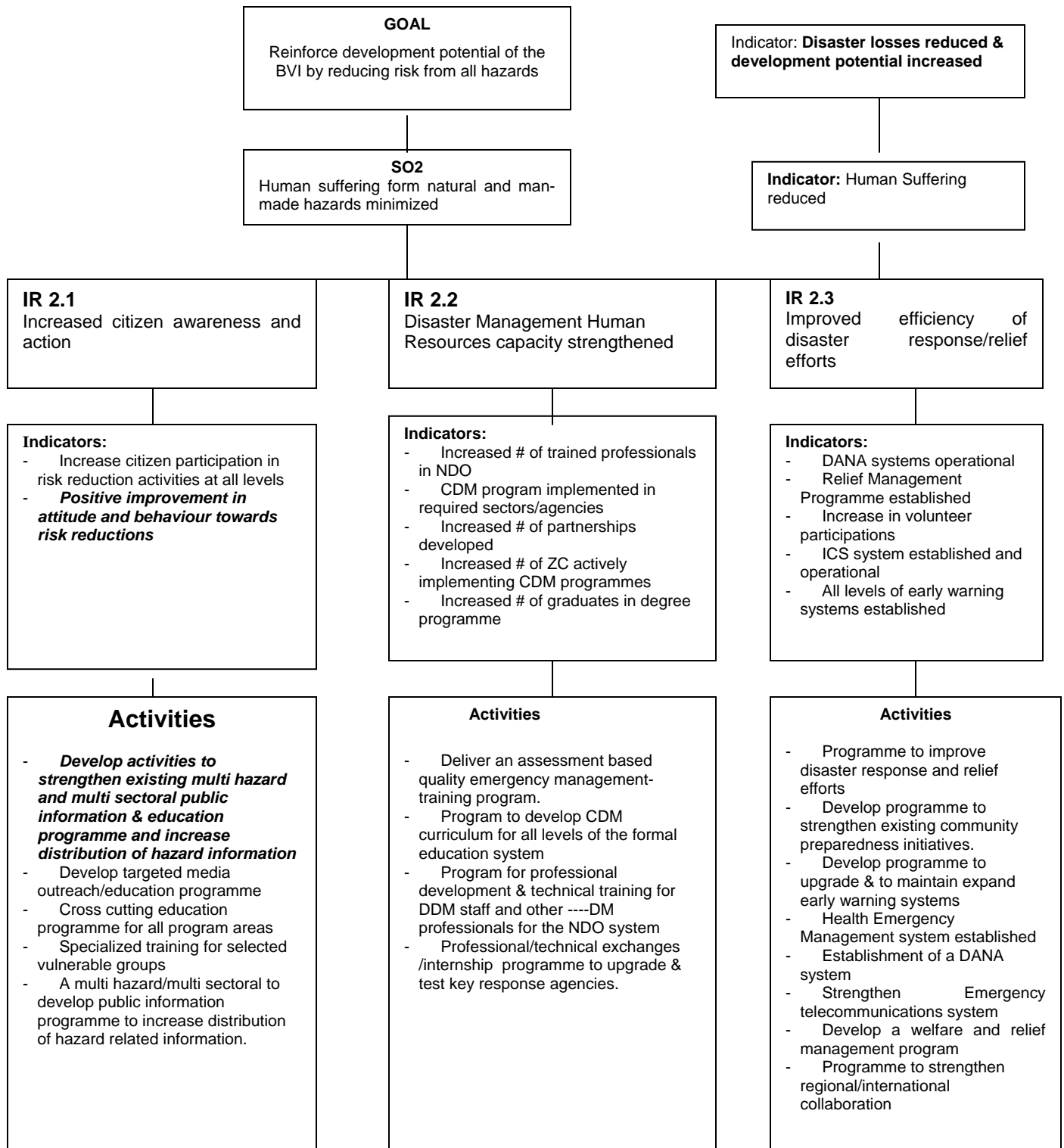
Turks and Caicos Islands

APPENDIX III CDM STRATEGY – BVI

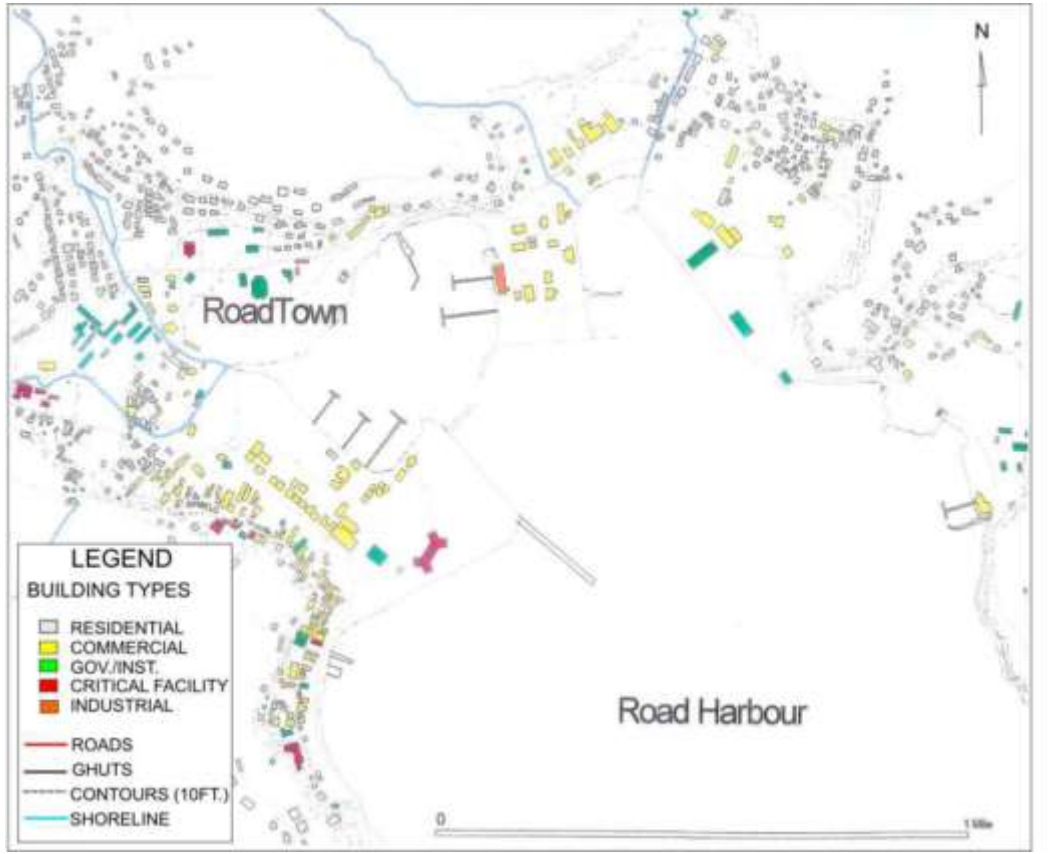
BVI CDM PROGRAM RESULTS FRAMEWORK



BVI CDM PROGRAM RESULTS FRAMEWORK



APPENDIX III: HRAP SAMPLE MAPS



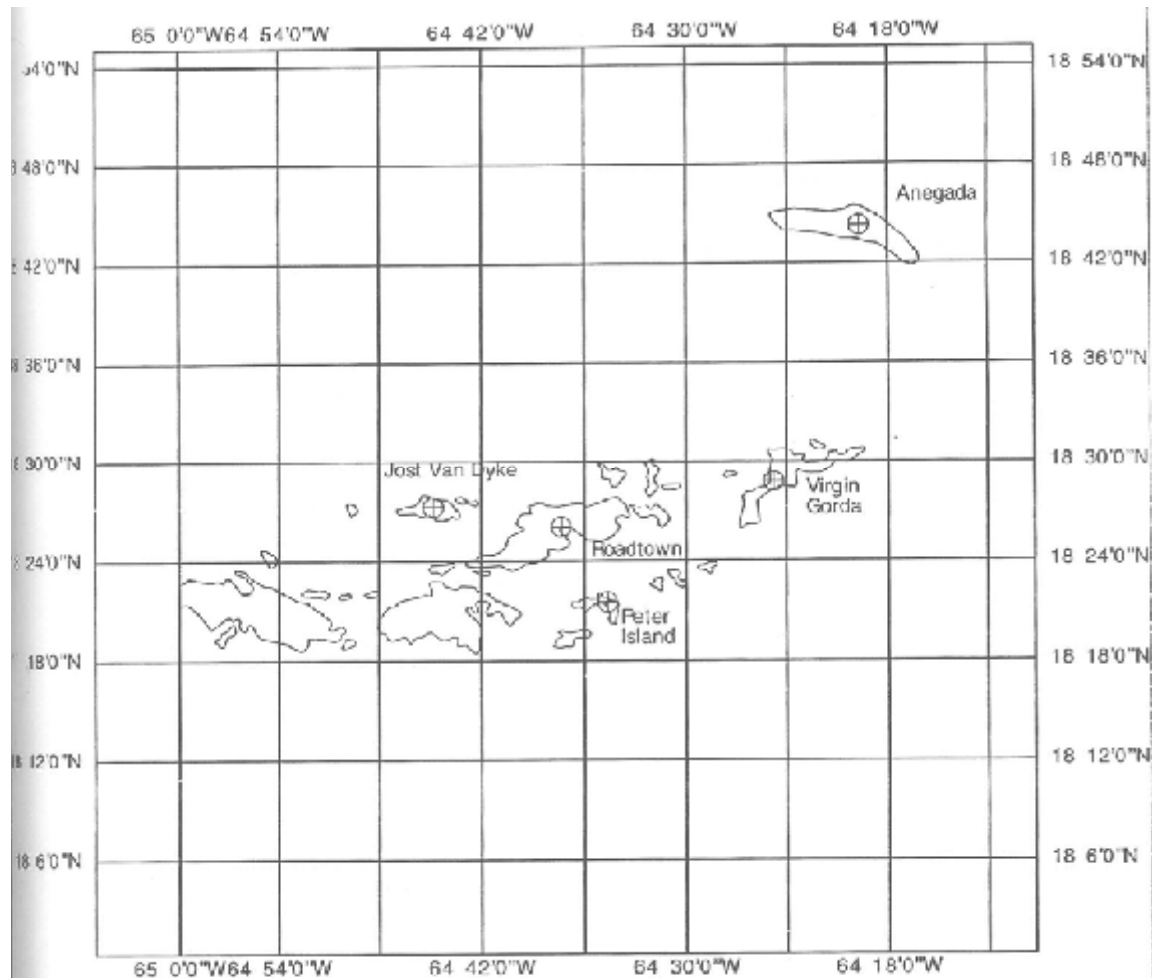
Road Town Flood Prone Areas
Huntums and Long Bush Ghats
25 years return period



Elevation (masl)

0.0 - 0.3048	
0.3048 - 1.0	
1.0 - 3.0	
3.0 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
10.0 - 12.5	
12.5 - 15.0	
15.0 - 20.0	
20.0 - 25.0	
25.0 - 30.0	
30.0 - 35.0	
35.0 - 40.0	
40.0 - 60.0	
> 60.0	





**British Virgin Islands
Return Time Analysis Sites**

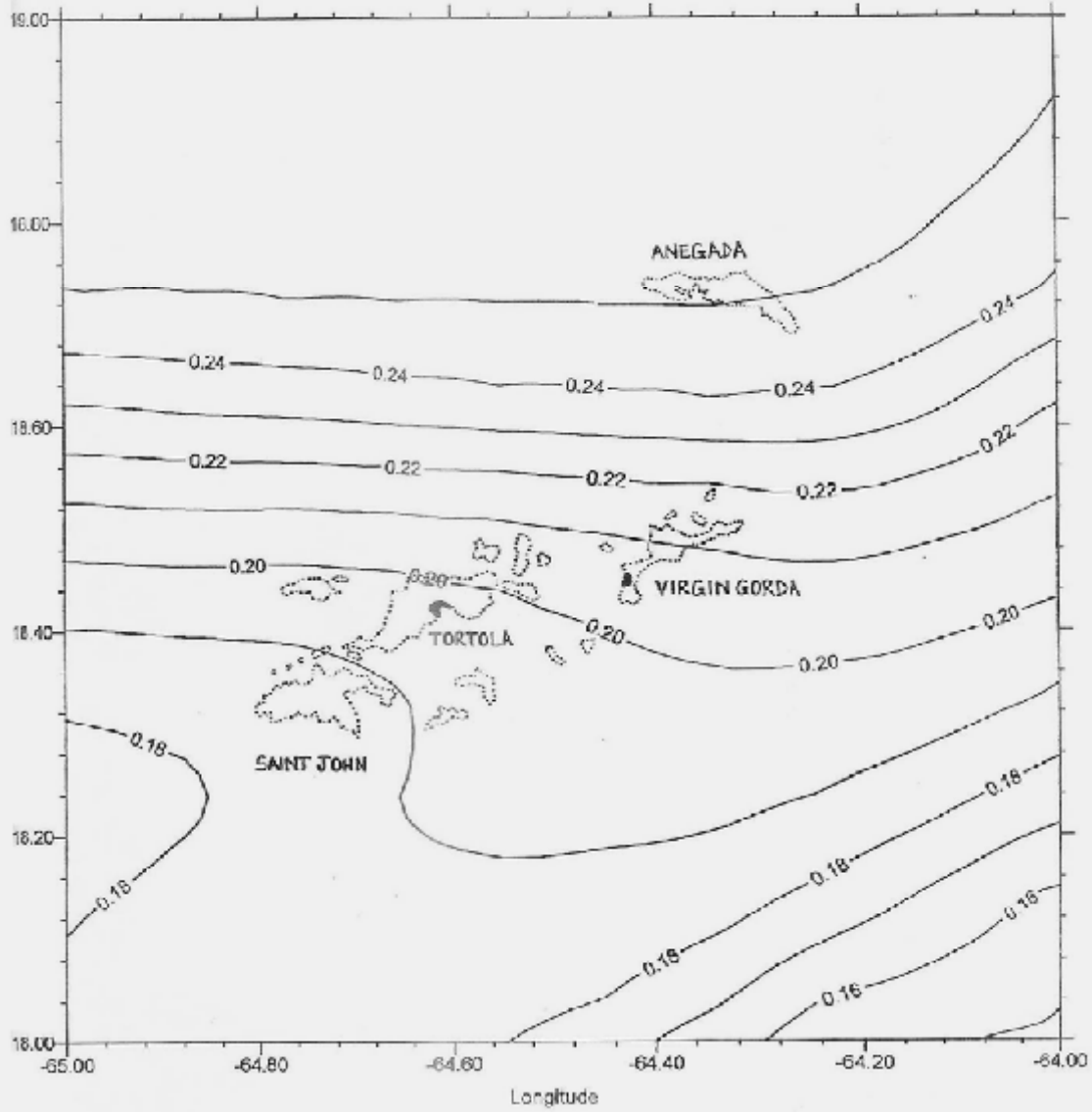


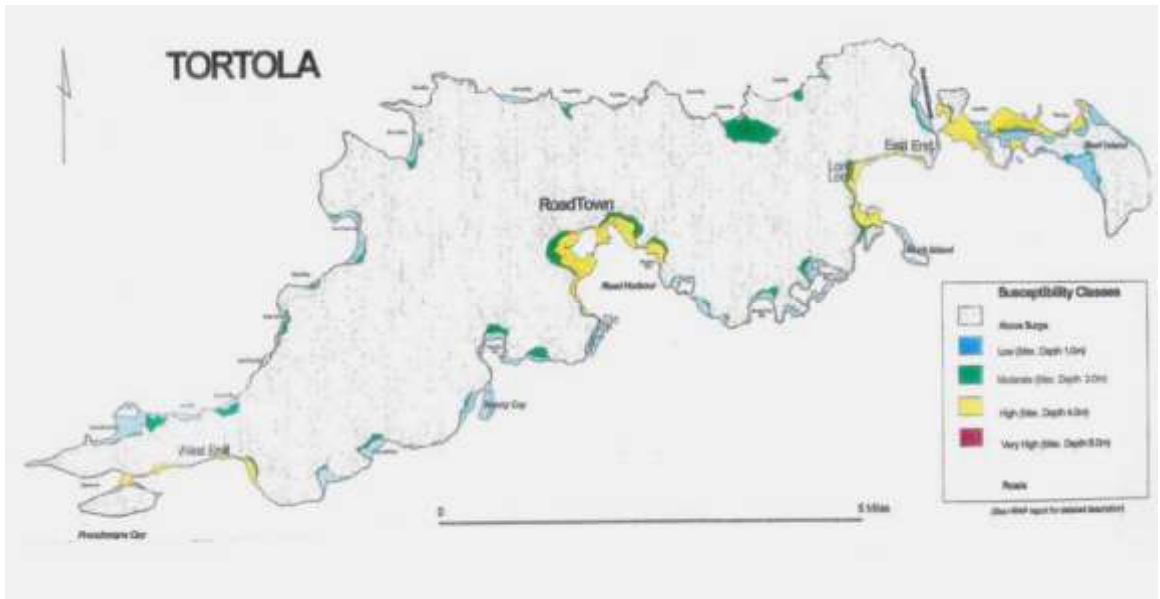
Average Return Time Summary:

Site	TS	1	2	3	4
Anegada	2.9	5.5	8.2	9.5	na
Virgin Gorda	2.8	6.3	10.9	20.3	32?
Peter Island	2.7	5.6	9.8	20.3	61?
Roadtown	2.8	6.3	10.9	16.8	30?
Jost van Dyke	2.6	6.3	10.9	??	31?

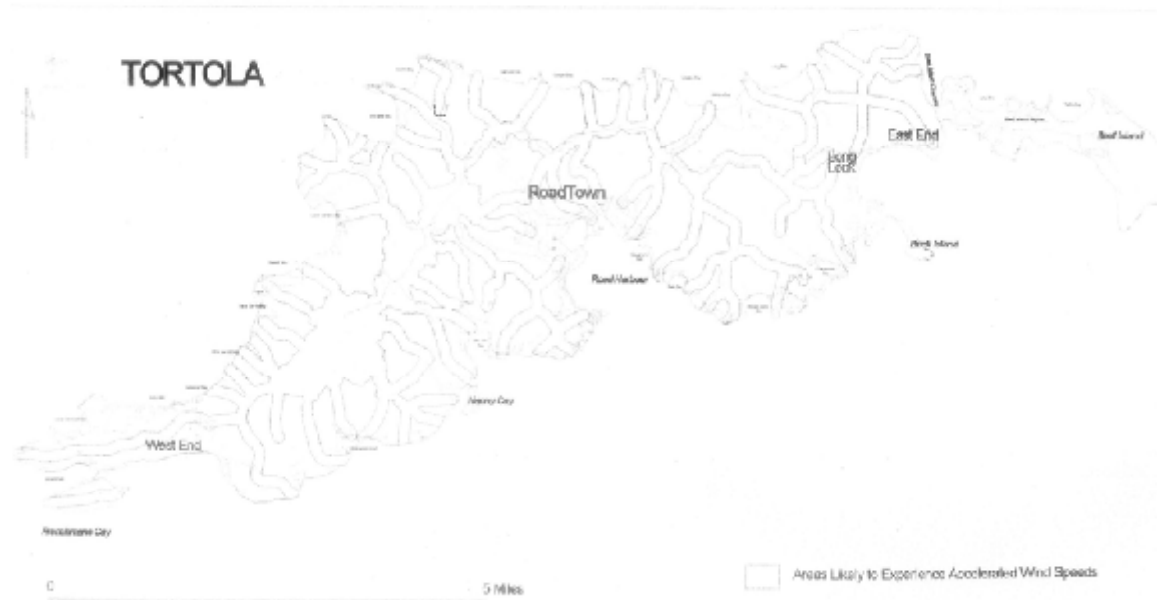
Return times in years for specified event or greater.
 ?? indicates statistics based on fewer than 5 events.

Spatial variation of Peak Horizontal Ground Acceleration with 90% probability of non-exceedance in 50 years for the BVI area.





STORM SURGE



WIND SPEED