

CGCED

**CARIBBEAN GROUP FOR COOPERATION
IN ECONOMIC DEVELOPMENT**

**24166 vol. 2
June 2002**

**NATURAL HAZARD RISK MANAGEMENT
IN THE CARIBBEAN:
GOOD PRACTICES AND COUNTRY CASE
STUDIES**

TECHNICAL ANNEX

**DISCUSSION
DRAFT**



Caribbean Country Management Unit
Latin America and the Caribbean Region
The World Bank

FILE COPY

This paper was prepared under the auspices of the Caribbean Group of Cooperation in Economic Development (CGCED). Established in 1977, the CGCED has evolved into a forum for policy dialogue and aid coordination among the Caribbean countries, international financial institutions, bilateral donors, non-governmental organizations, and private sector enterprises. A meeting of the CGCED has been held every two years in Washington, DC and chaired by the World Bank. In addition to country strategy papers, the following studies have been prepared for the 2002 meeting:

Caribbean Economic Overview 2002: Macroeconomic Volatility, Household Vulnerability, and Institutional and Policy Responses

(World Bank)

Implementation of the Caribbean Single Market and Economy

(Messrs. Brewster, Dolan, and Stewart)

Development Assistance and Economic Development in the Caribbean Region: Is There a Correlation?

(World Bank)

Natural Hazard Risk Management in the Caribbean: Revisiting the Challenge

Natural Hazard Risk Management in the Caribbean: Good Practices and Country Case Studies (Technical Annex)

(World Bank)

Youth Development in the Caribbean

(World Bank)

**NATURAL HAZARD RISK
MANAGEMENT IN THE
CARIBBEAN: GOOD
PRACTICES AND COUNTRY
CASE STUDIES**

TECHNICAL ANNEX

Report No. 24166-LAC

June 2002

Caribbean Country Management Unit
Latin America and the Caribbean Region
The World Bank

**NATURAL DISASTER RISK MANAGEMENT IN THE CARIBBEAN:
GOOD PRACTICES AND COUNTRY CASE STUDIES**

**TECHNICAL ANNEX
TABLE OF CONTENTS**

Page No.

<i>Introduction: A study of natural hazard risk management practices in the Caribbean.....</i>	<i>1</i>
A. Identification of good practices, assessment of actual practices	1
Individuals consulted for actual practice assessments.....	2
a) Antigua and Barbuda.....	2
b) British Virgin Islands	2
c) Dominica	2
d) Dominican Republic.....	3
e) Grenada	3
f) Jamaica.....	3
g) St. Kitts and Nevis.....	4
h) St. Lucia.....	4
i) St. Vincent and the Grenadines	4
j) OECS Sub-region	4
k) CARICOM Region.....	4
B. Regional review meeting	4
Regional review meeting participants	4
ANNEX 1: NATURAL HAZARD RISK MANAGEMENT GOOD PRACTICES.....	6
A. Risk management categories.....	6
1. Table 1: Good practices—risk identification.....	6
a) Hazard assessment and mapping	6
b) Vulnerability assessment	6
c) Risk assessment.....	7
2. Table 2: Good practices—risk reduction.....	7
a) Physical measures.....	7
b) Socio-economic measures	7
c) Environmental measures	7
d) Post-disaster measures.....	7
3. Table 3: Good practices—risk transfer.....	8
a) Budget self-insurance	8
b) Market insurance and reinsurance	8
c) Public asset coverage.....	8
d) Risk pooling and diversification.....	8
e) Risk financing.....	9

B.	<i>Risk management actors</i>	9
1.	Local level	9
a)	Civil society (communities and their organizations)	9
b)	Local government—policy and technical	9
c)	Local disaster committees	9
2.	National level	9
a)	Central planning and sectoral agencies—policy and technical	9
b)	National disaster office	9
c)	Business and industry—leadership and members	10
3.	Subregional level	10
a)	OECS framework	10
b)	Country to country collaboration	10
4.	Regional level	10
a)	Regional institutions	10
b)	Multi- and bi-lateral lending institutions and donors	10
	<i>ANNEX 2: SUMMARY OF RISK MANAGEMENT GOOD AND ACTUAL PRACTICES</i>	22
A.	<i>Risk Identification</i>	22
B.	<i>Risk Reduction</i>	26
C.	<i>Risk Transfer</i>	32
	<i>ANNEX 3: ASSESSMENTS OF RISK MANAGEMENT: ACTUAL PRACTICES</i>	35
	<i>Antigua and Barbuda</i>	36
	<i>British Virgin Islands</i>	47
	<i>Dominica</i>	56
	<i>Dominican Republic</i>	66
	<i>Grenada</i>	82
	<i>Jamaica</i>	92
	<i>St. Kitts and Nevis</i>	108
	<i>St. Lucia</i>	119
	<i>St. Vincent and the Grenadines</i>	131
	<i>OECS and CARICOM</i>	140

**NATURAL DISASTER RISK MANAGEMENT IN THE CARIBBEAN:
GOOD PRACTICES AND COUNTRY CASE STUDIES**

TECHNICAL ANNEX

Introduction: A study of natural hazard risk management practices in the Caribbean

During the first quarter of 2002, the World Bank contracted the Unit for Sustainable Development and the Environment of the OAS (OAS/USDE) to undertake a study of risk management practices in the Caribbean. The purpose of this study was to identify appropriate actions, agencies and levels for hazard risk management in the region. The results were used to identify good practices for natural hazard risk management, to highlight successful examples of these practices and to clarify significant risk management gaps in the region. In addition to their use within this project, the identified risk management good practices are intended to provide guidance and information for individuals, governments and organizations on useful hazard risk management interventions.

This study focused exclusively on policies and practices for long-term natural hazard risk management. Preparedness, response and recovery activities are not included in the analysis framework adopted in this paper. This is not to imply that these activities are unimportant; effective risk management is not possible without them. Despite existing discussions and successful pilot initiatives, natural hazard risk management initiatives do not have the same constituency and political support as do the traditional disaster management activities. Accordingly, the study was designed to address that gap by focusing exclusively on natural hazard risk management. The study covered risk management practices for natural hazards and did not include technological hazard considerations. A similar exercise is recommended addressing technological hazards, such as oil spills and industrial accidents.

A. Identification of good practices, assessment of actual practices

The first step in this process was to review existing natural hazard risk management practices and select appropriate or “good” activities. Activities were identified as good practices based on tangible, measurable outcomes, the capability of replication and the appropriateness for use within the Caribbean. The review process considered the principal dimensions of natural hazard risk management (risk identification, risk reduction, and risk transfer) and appropriate levels (local, national, region) for implementing the identified practice. Definitions of these risk management dimensions and actors are included in the following section.

Using the resulting good practices as a yardstick, actual management practices and gaps were assessed in Antigua and Barbuda, the British Virgin Islands, Dominica, the Dominican Republic, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, as well as at the sub-regional (OECS) and regional (CARICOM) levels. For each of these assessments, actual practices and gaps were summarized in separate matrices for risk identification, risk reduction and risk transfer activities. All entries are based on a complete, factual analysis and indicate actual, verifiable practices.

Caribbean consultants with risk management expertise carried out these assessments. In each of the study countries—and at the OECS and CARICOM levels—the consultants were charged with the following tasks:

- a. Contact appropriate government and private-sector representatives to determine risk identification and risk reduction practices currently in place.
- b. Determine, as appropriate to the local situation, the gaps between identified current practices and established good practices (i.e., where the actual practice is insufficient or where there is no comparable actual practice) and identify appropriate recommendations to address the gaps in practice.
- c. For each country, produce two matrices, which describe 1) actual practices and 2) the gaps in practice.

Consultant	Component(s)	Country(s)
Peter Adrien	Risk Transfer	Antigua/Barbuda, Dominica, Grenada, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, OECS, CARICOM
Tony Gibbs and Christine Herridge	Risk identification Risk reduction Risk transfer	Dominican Republic
Cedric Stephens	Risk transfer	Jamaica
Deborah Thomas	Risk identification Risk reduction Risk transfer [BVI only]	Antigua/Barbuda, British Virgin Islands, Dominica, Grenada, Jamaica, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, OECS, CARICOM

Upon completion of the detailed assessments, a series of matrices were developed. These documents are compiled in this technical annex.

Annex 1: Matrices of natural hazard risk management good practices for risk identification, risk reduction and risk transfer

Annex 2: Matrices of actual practice and gaps in practice in each of the study territories and for the OECS sub-region and the CARICOM region.

Annex 3: A summary table highlighting Caribbean examples for major risk management good practices.

The findings of and recommendations resulting from this work are described in the paper *Natural Hazard Risk Management in the Caribbean: Revisiting the Challenge*.

Individuals consulted for actual practice assessments

a) Antigua and Barbuda

- Fillmore Mullin—Deputy Director, National Office of Disaster Services
- Ehret Burton—General Manager, Industry and Commerce Insurance Company
- Holly Peters—Chamber of Industry and Commerce
- Robert Josiah—Acting General Manager, State Insurance, Antigua and Barbuda

b) British Virgin Islands

- Charlene D'Arbreau—Director, Department of Disaster Management
- Joseph Scatliff—Mitigation Officer, Department of Disaster Management
- Louis Potter—Chief Physical Planning Officer, Physical Planning Department
- William McCullough—Insurance Officer, Financial Services Department
- Shan Mohammed—NAGICO
- Otto O'Neal—Director of Planning and Statistics, Development Planning Unit, Ministry of Finance

c) Dominica

- Cecil Shillingford—Director, Office of Disaster Management
- Eric Shillingford—Development Control Officer, Physical Planning Division
- Nicholas Bruno—Acting Budget Director, Ministry of Finance

d) Dominican Republic

- Alfredo Ricart-Nouel—Consulting Structural Engineer
- Joachim Gustavo—Technical Director of Insurance
- Ing Simón Mahfoud—(until recently) Technical Vice President, Compañía Nacional de Seguros (now 2nd Vice President of Banco Reservas insurance company)
- Ing Evelio Martínez—2nd Vice-President of Engineering, Compañía Nacional de Seguros (SEGNA)
- Ing Máximo Viñas—General Advisor in Health, Industrial Safety and the Environment, REFIDOMSA (the Dominican Oil Refinery, affiliate of SHELL)
- Ing Américo Julio Peña—Environmental Advisor to the Senate of the Dominican Republic
- Ing Héctor O'Reilly—President of SODOSISMICA, Technical Advisor to Public Works
- Mr Ivan Reynoso—Executive Director of the Santiago Chamber of Commerce and Production
- Mr José Almonte—Director of Industrial Safety and Quality, CODETEL/VERIZON
- Mrs Paula Dimitri—Executive Director of the Santo Domingo Hotel Association
- Ing José Alarcón—Coordinator of the Risk Management and Zoning Component of the Technical Secretariat to the Presidency's Disaster Prevention Sub-Program
- Mrs María Rodríguez—Head, Environmental Planning Department of the National Planning Office

e) Grenada

- Joyce Thomas—National Disaster Coordinator, National Emergency Relief Organisation
- Cecil Fredericks—Senior Planning Officer (Ag), Physical Planning Unit
- Fabian Purcell—Planning Technologist, Physical Planning Unit
- Dennis Clarke—Director of Economic Affairs, Ministry of Finance and Planning
- David Phillip—Managing Director, NALGICO

f) Jamaica

- Paul Saunders—Director General (Ag), Office of Disaster Preparedness and Emergency Management
- Cecil Bailey—Senior Officer, Mitigation and Planning, ODPEM
- Joella Mitchell—Research Analyst, ODPEM
- Anestoria Shalkowski—Mitigation Project Officer, ODPEM
- Michelle Edwards—Planning Analyst, ODPEM
- Franklin McDonald—Chief Executive Officer, National Environment and Planning Agency
- Joy Alexander—Director of Planning and Development, NEPA
- Leonard Francis—Manager, Development Control Branch, NEPA
- Marc Rammelaere—Director, Information Technology, NEPA
- Rafi Ahmad—Disaster Studies Unit, UWI Department of Geology and Geography
- Alfrico Adams—Consulting Engineer, SMADA Consultants Ltd
- Richard Black—Group Security Manager, Grace Kennedy Ltd
- Herbert Thomas—Water Resources Authority
- Norman Harris—Director of Applied Research, Mines and Geology Division
- Joseph A. Bailey—General Manager, Building Societies Association of Ja.
- Greta Bogues—CEO, Private Sector Association of Ja.
- Leslie Chung—Chairman, Jamaica Assn of General Insurance Cos.
- Carmen Griffiths—Executive Director, Construction & Resources Dev. Centre
- Stephen Hodges—Director, Construction & Resources Dev. Centre
- David Linehan—President, Jamaica Insurance Brokers Association
- Geoffery Melbourne—Associate actuary, Watson Wyatt & Duggan Consulting Actuaries
- Michelle Rose—Construction Resources Dev. Centre
- Devon Rowe—Deputy Financial Secretary [economics], Ministry of Finance & Planning
- Mr. Evan Thwaites—Deputy Chairman, Jamaica Assn of General Insurance Cos.

- Brian Wynter—Executive Director, Financial Services Commission

g) St. Kitts and Nevis

- Carl Herbert—National Disaster Coordinator (Ag), National Emergency Management Association
- Ellis Hazel—Chief Planner, Physical Planning Department
- Llewellyn Newton—Disaster Coordinator (Nevis) National Emergency Management Agency
- Ruth Joseph—Insurance Regulator, Ministry of Finance
- Oliver Knight—Director of Planning, Ministry of Finance, Development and Planning
- Patrick Williams—Senior Physical Planning Officer, Ministry of Finance, Development and Planning

h) St. Lucia

- Dawn French—Director (Ag), Office of Disaster Preparedness
- Daune Heholt—Deputy Physical Planning, Officer Physical Planning Department
- Judith Joe—Supervisor of Insurance, Ministry and Planning
- Reginald Darius—Director of Finance, Ministry of Finance and Planning
- Phillip Dalsou—Comptroller of Budget, Ministry of Finance and Planning

i) St. Vincent and the Grenadines

- Howie M. Prince—National Disaster Coordinator, National Emergency Organisation
- Ms. Laura Anthony Brown—Director of Planning, Central Planning Division
- Isaac Solomon—Budget Director, Ministry of Finance and Planning

j) OECS Sub-region

- David Popo—Project Officer, Watershed Management Project and Small Projects Facility, OECS/NRMU
- Doug Hickman—Field Manager, Environmental Capacity Development Project, OECS/NRMU
- Allister Campbell, Director General, Insurance Association of the Caribbean (IAC)

k) CARICOM Region

- Dr. Cassandra Rogers—Project Manager, Disaster Mitigation Facility, Caribbean Development Bank
- Jennifer Worrell—Regional Disaster Adviser, USAID
- Donovan Gentles—Preparedness and Response Manager, CDERA
- Evelyn Wayne, Deputy Programme Manager, Macroeconomics and Trade Policy Coordinator
- Jeremy Collymore, Coordinator, Caribbean Disaster and Emergency Agency (CDERA)

B. Regional review meeting

In March 2002, a two-day regional meeting was convened in Kingston, Jamaica, to review the results of the actual practice assessments and a draft of the document *Natural Hazard Risk Management in the Caribbean: Revisiting the Challenge*. Participants in the meeting represented national disaster and environmental agencies, CDERA, the Caribbean Development Bank, USAID, UNDP, the World Bank and the OAS/USDE. A participant list is included in this annex. The results of the discussions at this meeting were used to update and prepare a final draft of the main report, *Natural Hazard Risk Management in the Caribbean: Revisiting the Challenge*.

Regional review meeting participants

- Oliver Davidson—Consultant, World Bank

- Arnaud Guinard—World Bank
- Eleanor Jones—Environmental Solutions, Jamaica
- Ambassador Mosina Jordan—USAID-Jamaica
- Franklin McDonald—NEPA, Jamaica
- Bartholomew Nyarko-Mensah—UNDP-Barbados
- Elizabeth Riley—CDERA
- Cassandra Rogers—CDB-DMFC
- Paul Saunders—ODPEM, Jamaica
- Joyce Thomas—NERO, Grenada
- Steven Stichter—OAS/USDE
- Jennifer Worrell—USAID-OFDA/LAC

ANNEX 1: NATURAL HAZARD RISK MANAGEMENT GOOD PRACTICES

A. *Risk management categories*

Many related, but slightly differentiated, definitions exist for disaster management and mitigation concepts. This section describes the definitions that were adopted in creating the good practices matrices. These descriptions provide a context for review, discussion and use of these matrices; they are not intended as definitive explanations for these concepts.

1. *Table 1: Good practices—risk identification*

a) **Hazard assessment and mapping**

Hazard assessments are studies that provide information on the probable location and severity of dangerous natural phenomena and the likelihood of their occurrence within a specific time period in a given area. These studies rely heavily on available scientific information, including geologic, geomorphic, and soil maps; climate and hydrological data; and topographic maps, aerial photographs, and satellite imagery. Historical information, both written reports and oral accounts from long-term residents, also helps characterize potential hazardous events. Ideally, a natural hazard assessment promotes an awareness of the issue among all stakeholders in an affected area, evaluates the threat of natural hazards, and describes the distribution of historical or potential hazard effects across the study area.

b) **Vulnerability assessment**

Vulnerability assessments are systematic examinations of building elements, facilities, population groups or components of the economy to identify features that are susceptible to damage from the effects of natural hazards. Vulnerability is a function of the prevalent hazards and the characteristics and quantity of resources or population exposed (or "at risk") to their effects. Vulnerability can be estimated for individual structures, for specific sectors or for selected geographic areas, e.g., areas with the greatest development potential or already developed areas in hazardous zones.

- ***Socio-economic vulnerability.*** A social vulnerability assessment evaluates the vulnerability of the population and the economy to the effects of hazards. Both direct effects, such as personal injuries, and indirect effects, including interruption of employment and economic activities, disruption of social networks and increased incidence of disease are included. Significant differences in vulnerability typically exist among different segments of the population, due to factors such as quality of housing, financial stability and access to assistance.
- ***Physical vulnerability.*** A physical vulnerability assessment focuses on the vulnerability of the built environment, including buildings, homes, infrastructure and roads. Such an assessment includes reviews of the standards used in design and construction, locational vulnerability factors, current status and maintenance practices. Physical vulnerability assessments are useful tools for identifying deficiencies in current building and maintenance practices, for determining appropriate locations and uses for buildings and facilities and for prioritizing the use of resources for retrofit and upgrading of structures.
- ***Environmental vulnerability.*** Many environmental systems stabilize potential hazards or buffer their effects. Intact forests stands can support unstable steep slopes and reduce soil runoff and sedimentation. Coral reefs and mangroves can help anchor coastlines and reduce the impact of storm surges and waves. Degraded systems are less able to perform these functions, more vulnerable to damage and are less resilient in recovery from hazard effects. Improper development, management or repeated hazard damage contribute to this degradation.

c) Risk assessment

A risk assessment is an estimate of the expected loss to a system exposed to a given hazardous event. It is a function of the probability of the hazard and the vulnerability of the components that can be affected by the hazard. Carrying out a risk assessment requires an estimate of the probability of experiencing the selected event and an understanding of the effects of such an event on the resources at risk—people, structures, employment and the economy—in the assessment area. A probable maximum loss study is one example of a risk assessment. Results of such an assessment are important for prioritizing investments in vulnerability reduction and for understanding insurance and reserve funds requirements.

2. Table 2: Good practices—risk reduction

a) Physical measures

- **Structural.** Structural risk reduction measures include any actions that require the construction or strengthening of facilities or altering of the environment to reduce the effects of a hazard event. Measures to strengthen public- and private-sector buildings or facilities include flood- and wind proofing, elevation, seismic retrofitting and burial (e.g. utilities). Such measures are designed to reduce or eliminate damage to structures and their contents and functions. Environment alteration measures are designed to stabilize an otherwise unstable or hazardous area, to redirect a hazard or to reinforce natural systems that buffer hazard effects. Such measures include sediment trapping structures, shore protection and flood control works, slope stabilization, brush clearing and wetlands protection.
- **Non-structural.** Non-structural measures are changes to policies and programs that guide future development and investment towards reduced vulnerability to hazards. Examples of non-structural measures include physical development planning, development regulations, acquisition of hazardous properties, tax and fiscal incentives and public education. Typically, non-structural measures are significantly less costly than structural measures, but they have little immediate effect on reducing vulnerability and require oversight by the government to ensure continued, proper implementation.

b) Socio-economic measures

Social risk reduction measures are designed to address gaps and weaknesses in the systems whereby communities and society as a whole prepare for and respond to disaster events. These measures are typically the responsibility of the National Disaster Offices and associated district- or community-level organizations. Effective community- and national-level social networks and health systems can also contribute to assuring continuity and recovery after a disaster event. Weaknesses in these systems are often concentrated in disadvantaged areas and groups. Awareness programs addressing existing hazards and physical and social vulnerabilities are often central to social risk reduction.

c) Environmental measures

Environmental risk reduction measures are designed to protect existing or rehabilitate degraded environmental systems that have the capacity to reduce the impacts of natural hazards. These can take the form of policies and programs, such as development control or environmental impact assessments, that reduce or eliminate the effect of human activities on the environment. They can also include physical measures that restore or fortify damaged environmental systems. Secondary effects of hazard events, such as oil spills caused by flooding, must also be addressed as they often cause more significant environmental damage than do primary effects.

d) Post-disaster measures

In the aftermath of a disaster, there is great pressure to repair damage quickly. However, the quality of the reconstruction and rehabilitation work that takes place during this period often determines how well the same

system weathers future hazard events. Time and budget pressures and the difficulties in communication and transport in the post-disaster environment make it difficult to increase resilience during reconstruction. Putting in place pre-approved and tested reconstruction plans and procedures, with identified financing, can significantly reduce vulnerability to future hazard events, while overcoming the traditional time and budget constraints. Although reconstruction measures are a component of long-term response and recovery, they can form a critical component of a comprehensive risk reduction program, as the recovery period provides an important window of opportunity for implementing necessary risk reduction measures.

3. *Table 3: Good practices—risk transfer*

a) Budget self-insurance

The owner of a property—the government, a private company or an individual—allocates a modest yearly budget to spend on improved maintenance and on selected retrofit investments, which have the effect of reducing future expected losses in the event of a disaster. This enables the owner either to forego the purchase of regular insurance or to accept a higher deductible, thus reducing the cost of insurance.

b) Market insurance and reinsurance

Insurance provides coverage for damage and expenses that are beyond the potential for budget self-insurance. Market insurance stabilizes loss payments through pre-payment in the form of regular premium payments. Once the extent of coverage has been agreed and premiums paid under an insurance contract, the insurer assumes the risk. Insurance makes available funds necessary to repair damage or rebuild shortly after a disaster event. Insurance costs for certain categories of buildings or uses, however, may be unaffordable. Coverage for some categories of natural hazards may also be unavailable. Business interruption insurance can help companies and their employees survive the recovery and rehabilitation period.

It is important to note that insurance as a mechanism does not reduce actual vulnerability and is inefficient from a cost perspective. Consequently, all efforts to reduce the vulnerability of the assets to be insured should be taken before transferring the risk through insurance. To be sustainable, insurance mechanisms should qualify risks and strive to bring in good risks, not serve as a dumping ground for bad or unwise risks. Great reliance on reinsurance in the Caribbean makes insurance prices in the region vulnerable to shocks unrelated to immediate disaster experiences in the region.

c) Public asset coverage

Most public assets are not covered by insurance. Funds for rebuilding damaged assets must come from annual budgets or external sources. This puts great pressure on public budgets in the post-disaster period when economies are often particularly weak, as typically little has been set aside for budget self-insurance purposes. Insurance coverage for critical public assets will ensure that key infrastructure can be rebuilt or rehabilitated quickly if damaged in a hazard event. Selection of assets that merit insurance coverage should be based on careful prioritization public facilities and on comprehensive facility vulnerability assessments.

d) Risk pooling and diversification

Insurance costs for geographically concentrated or relatively homogeneous groups or facilities are often high, due to the potential for simultaneous damage to all members of the group or category. Diversification of the risk pool, through banding with others from other areas or industries can result in reduced insurance premiums for all participants.

e) **Risk financing**

Risk financing mechanisms allow losses to be paid off in the medium- to long-term via some form of a credit facility. Alternative risk financing mechanisms provide cost-effective, multi-year coverage that assists with the stabilization of premiums and increases the availability of funds for insurance purposes. Examples of such mechanisms include credit backstop facilities and finite insurance mechanisms.

B. Risk management actors

Natural hazard risk management actions can be taken at many different levels. Typically, decisions that can be made and actions taken close to the individual- and community-level have more immediate and significant effects than do more distant ones. In cases where decision-making power and organizational mechanisms exist only at other levels, decisions and actions must be taken at those higher levels. The appropriate management level also depends upon the magnitude of the issue or impact. Problems that are broader or larger than can be handled by an individual community or, in some cases, country must be addressed by higher level actors.

1. Local level

a) **Civil society (communities and their organizations)**

Many organizations and groups exist at the local level to serve communities, often focused on specific geographic areas. Churches, service organizations, school-related groups and sports clubs can serve as information conduits, provide mutual support for members and neighbors and identify practices and developments that increase or decrease hazard vulnerability. Although placed at the local level within this framework, it is clearly understood that civil society plays a strong role in risk management at the national and regional levels.

b) **Local government—policy and technical**

Local governments, where they exist and function, can guide local vulnerability reduction efforts through policies and through the provision of technical assistance, informed by a clear understanding of local conditions and experiences.

c) **Local disaster committees**

Most national disaster and emergency management organizations in the region support a network of local disaster committees. These committees implement the activities of the national disaster organization, such as local shelter management and inform national disaster policies and actions through local disaster management planning.

2. National level

a) **Central planning and sectoral agencies—policy and technical**

National-level planning and sectoral agencies guide and implement national government policies and technical assistance. Both long-term planning activities and the day-to-day workings of the national government can significantly increase or decrease the current and long-term vulnerability of a country to natural hazards.

b) **National disaster office**

National disaster offices (NDOs) are responsible for developing and implementing disaster preparedness, response and recovery efforts at the national and local levels. NDOs can also serve as the major champion of risk reduction initiatives. However, most mitigation actions and initiatives, by their nature, must be implemented

by the sectoral agencies and organizations responsible for the infrastructure, assets, programs and individuals involved.

c) Business and industry—leadership and members

Private companies and their organizations—chambers of commerce, business and trade associations and standards organizations—control the majority of the businesses and assets that make up a country's economy. Their decisions on how to invest, build, maintain and insure these assets can have a significant effect on how well a country's economy can weather and recover from a natural hazard event. Although placed at the national level within this framework, it is clearly understood that business and industry actors play a strong role in risk management at the local and regional levels as well.

3. Subregional level

a) OECS framework

The secretariat and specialized agencies of the Organization of Eastern Caribbean States (OECS) provide assistance to OECS member countries, which can contribute to vulnerability reduction within the OECS sub-region. Development of appropriate model legislation, harmonization of existing legislation, collaboration on sub-regional financial issues, such as risk pooling, are examples of appropriate actions that can be taken at the sub-regional level.

b) Country to country collaboration

Effective horizontal cooperation, including sharing of lessons learned, good practices and post-disaster assistance, strengthens the resilience of the entire region to the effects of natural hazards.

4. Regional level

a) Regional institutions

Regional institutions, both private sector and inter-governmental, can play an important role in facilitating adoption of appropriate risk management practices by member countries and organizations.

b) Multi- and bi-lateral lending institutions and donors

Bi- and multi-lateral lending institutions can affect the vulnerability of the region to natural hazards through their lending programs. By ensuring that funded projects are appropriately sited and constructed, these institutions can contribute to overall risk management, rather than funding newly vulnerable assets.

Table 1: Risk Identification – Good Practices

Entries in the matrix include both good practices outcomes and instruments. Good practices outcomes indicate the desired state or objective and are designated by bullets (•) and plain text. Good practices instruments are technical and institutional mechanisms that need to be deployed to reach the desired outcome; instruments are described in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society <i>(Communities and their organizations)</i>		<ul style="list-style-type: none"> Population groups are aware of local hazards. <i>Easy to understand hazard maps are readily available in the community and the local hazard history is regularly updated with information about new events, both large and small. Markers indicating the site of hazard events posted as appropriate.</i> Local groups are trained to recognize indicators of local hazards. Local communities/groups communicate local hazard information upward to local and national institutions. 	<ul style="list-style-type: none"> Population groups are aware of their vulnerability. <i>The community participates in "walk-through" mapping exercise to identify hazards and vulnerabilities. Community leadership provides members with hazard maps to guide settlements.</i> Trade associations, service organizations and churches disseminate hazard preparedness and mitigation information 	<ul style="list-style-type: none"> Public building uses appropriate to hazard resilience and safety. <i>Inventories of population centers and important structures conducted to assess vulnerability to local hazards.</i> 	<ul style="list-style-type: none"> Local groups trained to identify and protect environmental systems that stabilize potential hazards or buffer hazard effects. Local groups identify the role of environmental management practices that increase vulnerability and risk (locally and downstream), and identify and assess the causes of environmental decline (soil erosion, deforestation, beach erosion, loss of mangroves, etc) in the context of local hazard history. Communicate this information upward to local and national institutions. 	<ul style="list-style-type: none"> Highly vulnerable groups, settlements and facilities identified.
Local Government	Policy		<ul style="list-style-type: none"> Use of individual emergency shelters limited by results of the vulnerability assessment. <i>Appropriate uses well advertised. Designated emergency shelters assessed for vulnerability to local hazards to determine appropriate and safe uses.</i> 	<ul style="list-style-type: none"> Hazard-prone areas identified <i>Local ordinances reviewed and amended to include risk reduction initiatives. Public-sector regulations reinforce appropriate siting and construction standards.</i> Inventories of important structures conducted to assess vulnerability to local hazards. <i>Appropriate building uses determined based on these assessments.</i> 	<ul style="list-style-type: none"> Local government monitors environmental quality and communicates information upward to national institutions (see above). 	<ul style="list-style-type: none"> Local government has access to risk maps at local level. <i>New location and structural development standards appropriate to hazards indicated on maps.</i>
	Technical	<ul style="list-style-type: none"> Hazard maps and information are available to local communities in an easy to understand form and at the appropriate scale. Inventories of critical facilities completed and available to communities. Permanent flood and storm surge level markers erected. 	<ul style="list-style-type: none"> Causes of hazard-related damages studied and remedies broadly disseminated. 	<ul style="list-style-type: none"> Causes of hazard-related damages studied and remedies broadly disseminated. 		

Table 1: Risk Identification – Good Practices

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
<i>Local Disaster Committees</i>		<ul style="list-style-type: none"> Disaster Committees have access to and understand hazard maps at local level. 	<ul style="list-style-type: none"> Disaster committees have identified highly vulnerable population groups. 	<ul style="list-style-type: none"> Disaster committees have identified highly vulnerable development and infrastructure groups. 		<ul style="list-style-type: none"> Disaster Committees have access to and understand risk maps at local level.
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>	<ul style="list-style-type: none"> National Disaster Mitigation program established, with cabinet-level responsibility. 	<ul style="list-style-type: none"> Government agencies have identified highly vulnerable population groups. Risk reduction priorities established based on socio-economic impacts. 	<ul style="list-style-type: none"> Hazard vulnerability assessment required as part of project appraisal. 	<ul style="list-style-type: none"> National development policies and plans protect natural systems that contribute to hazard stabilization or mitigation. 	<ul style="list-style-type: none"> Risk maps available for prevalent hazards.
	<i>Technical</i>	<ul style="list-style-type: none"> Hazard mapping procedures and mechanisms established and initiated. <i>Physical Planning Department prepares hazard maps for each hazard and integrates these into the national GIS database. Appropriate recording devices and mechanisms installed.</i> 	<ul style="list-style-type: none"> Hazard vulnerability self-assessment techniques are available to all socioeconomic groups. Vulnerability reduction measures prioritized based on socio-economic impacts Local agricultural assistance programs highlight risk of hazards to agriculture, assist farmers with mitigation measures. 	<ul style="list-style-type: none"> Development standards are resilient to prevalent natural hazards. Standards developed for appropriate building materials. <i>Standards enforced through customs and standards restrictions.</i> 	<ul style="list-style-type: none"> Indicators of environmental degradation developed and monitored. Causes of degradation, particularly when contributing to hazard risk, identified and monitored. National 'State of the Environment' report prepared, including recognition of links between environmental quality and hazards. 	<ul style="list-style-type: none"> All government agencies maintain current inventories of their physical assets
<i>National Disaster Office</i>		<ul style="list-style-type: none"> Disaster office promotes the use of hazard information development and investment decisions across all sectors of government and the economy. 	<ul style="list-style-type: none"> NDO has identified highly vulnerable population groups. NDO has developed vulnerability reduction programs targeting these groups. 	<ul style="list-style-type: none"> NDO has updated an inventory of all critical facilities, and results of a recent vulnerability audit of these facilities. 	<ul style="list-style-type: none"> Link between environmental degradation and hazards highlighted in awareness campaigns. NDO hazard awareness campaign includes information on link between hazards and the environment. 	

Table 1: Risk Identification – Good Practices

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Business and Industry, Financial	Leaders	<ul style="list-style-type: none"> Business/industry and government leaders cooperate in a formal process to identify facilities and services critical to economic and social development, regardless of ownership, e.g. utilities, medical, transportation and financial. Businesses/industry to identify risk reduction interventions to be undertaken by the government that are critical to its operations through and after a hazard event, to determine assistance and guidance that the private sector can provide to the government. Businesses/industry support development, distribution and use of hazard maps. 	<ul style="list-style-type: none"> Leaders involved in local and national disaster committees. 	<ul style="list-style-type: none"> Primary hazard implications and remedies compiled for each major sector. <i>Private sector construction conforms to appropriate building standards. Costs of business interruption due to direct and indirect hazard effects included in assessment.</i> Physical development guided to less hazard-prone areas. <i>Private-sector incentives reinforce appropriate siting and construction standards.</i> Safer building "seal of approval" program developed and implemented. 	<ul style="list-style-type: none"> Environmental features and protective systems protected in new developments. Environmental impact assessments that include attention to hazards used in decision making. 	<ul style="list-style-type: none"> Insurance companies have updated risk assessments for their portfolios. <i>By regulation insurers establish auditable precise catastrophe peril liability inventories. By regulation insurers and lenders to report their programs for discriminatory pricing & conditions reflecting distinctive storm protection categories of structures.</i>
	Members	<ul style="list-style-type: none"> Available hazard maps regularly used in decision making. Local businesses or technical volunteers conduct structural assessments of facilities. 		<ul style="list-style-type: none"> Companies have completed vulnerability audits of their facilities and support networks. 		
Subregional						
OECS Framework		<ul style="list-style-type: none"> Central clearinghouse established for hazard mapping and assessment good practices. 			<ul style="list-style-type: none"> Link between environmental degradation and hazards clearly stated in regional environmental charter. 	
Inter-Country Collaboration						
Regional						
Regional Institutions		<ul style="list-style-type: none"> Regional technical institutions provide mapping and assessment assistance to national governments. <i>Heads of State of the region support and fund this role for regional institutions.</i> 	<ul style="list-style-type: none"> Central banks provide modeling services for alternative disaster impacts. 	<ul style="list-style-type: none"> Standard vulnerability assessment approaches documented. <i>Recommended vulnerability reduction techniques for common construction practices compiled and available.</i> 		
Multilateral Lending Institutions, Bilateral Donors		<ul style="list-style-type: none"> Available hazard maps regularly used in decision making. Hazard assessment and mapping supported in development programs. 			<ul style="list-style-type: none"> Mitigation goals incorporated into environmental protection/enhancement projects, and into environmental assessments for other projects (particularly infrastructure development.) 	<ul style="list-style-type: none"> Available risk information regularly used in decision making. Risk assessment and mapping supported in development programs.

Table 2: Risk Reduction – Good Practices

Entries in the matrix include both good practices outcomes and instruments. Good practices outcomes indicate the desired state or objective and are designated by bullets (•) and plain text. Good practices instruments are technical and institutional mechanisms that need to be deployed to reach the desired outcome; instruments are described in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
Civil Society <i>(Communities and their organizations)</i>		<i>Public displays of examples of appropriate and inappropriate hazard-resistant building techniques erected.</i>	<ul style="list-style-type: none"> • Communities question the standards of all new construction and of major refurbishment projects. 	<ul style="list-style-type: none"> • Hazard and vulnerability reduction information incorporated into school curricula. • Poverty-related vulnerability identified and addressed. 	<ul style="list-style-type: none"> • Mechanisms and knowledge required to identify environmental degradation developed and implemented. 	<ul style="list-style-type: none"> • Appropriate building materials (straps, screws, washers, galvanize of sufficient gauge) available, with proper installation instructions. • Causes of damages reviewed and documented. • Communities review the standards of all repairs.
Local Government	Policy	<ul style="list-style-type: none"> • Local public infrastructure constructed outside hazardous areas. 	<ul style="list-style-type: none"> • No housing in hazard-prone areas or housing resilient to prevalent hazards. <i>Community leadership provides members with hazard maps to guide settlements.</i> <i>Relocation policies developed and procedures standardized, documented and disseminated.</i> • Building Code is published and training courses are held regularly. <i>Public information campaigns conducted to demonstrate code benefits, layman summaries of code requirements available.</i> 		<ul style="list-style-type: none"> • Local environmental regulation (e.g. tree cover preservation, land use and agricultural standards) in place and enforced. 	<ul style="list-style-type: none"> • Recovery plans, including budget estimates, have been approved by political leaders.
	Technical					
Local Disaster Committees				<ul style="list-style-type: none"> • Local Committee has emergency contingency plans, training and technical skills. <i>Membership includes recognized local leaders.</i> <i>Local Committee regularly conducts hazard awareness campaigns in appropriate media and accessible language.</i> 	<ul style="list-style-type: none"> • Links established with local environmental organizations. 	

Table 2: Risk Reduction – Good Practices

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<ul style="list-style-type: none"> All new public buildings conform to appropriate building codes and standards. 	<ul style="list-style-type: none"> Building code is the basis for development approval. Adherence to the code is enforced. <i>Licensing standards tied to building code.</i> Location of housing and infrastructure is guided by land use plans that incorporate multi-hazard vulnerability reduction measures. A trained building inspectorate is in place, with appropriate powers to review and control building standards. Development standards are tailored to hazard effects expected in each island or community (<i>e.g. set storm protection standards to target < 5% average loss/damage to structures in a Class III (<125mph) storm.</i>) Quality standards for building materials developed and enforced. External reviews of designs and quality control conducted during construction of all important facilities. 	<ul style="list-style-type: none"> Deficiencies in infrastructure that increase vulnerability (e.g. inadequate sanitation systems) identified and addressed. 	<ul style="list-style-type: none"> Environmental management and protection policies and programs include protection for natural systems that stabilize hazardous areas or mitigate hazard effects. Environmental impact assessments include natural hazard considerations and are used (enforced) in planning decisions. Agriculture and forestry practices do not degrade protective natural systems. 	<ul style="list-style-type: none"> Recovery plans and actions incorporate risk reduction actions. Financing for immediate recovery actions identified and available.
	Technical	<ul style="list-style-type: none"> Appropriate technical staff across all agencies are familiar with and use building code. 	<ul style="list-style-type: none"> Sufficient training and budget provided for proper enforcement of development and environmental standards. 			
National Disaster Office			<ul style="list-style-type: none"> NDO promotes risk reduction to all sectors of the government and economy. 	<ul style="list-style-type: none"> Political leaders' roles are clear and public expectations are understood. Technical experts are available to execute their functions. 		<ul style="list-style-type: none"> Standards for rehabilitation and new construction of post-disaster assets reviewed for adequacy.

Table 2: Risk Reduction – Good Practices

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Business and Industry	Leadership	<ul style="list-style-type: none"> • Participate in civic organizations that promote loss reduction. • Coordinate with the government on common risk management concerns. 	<ul style="list-style-type: none"> • Hazard information used to provide incentives for better development practices. • Public education and advertising support and demonstrate vulnerability reduction measures. • Companies advertise and offer benefits for vulnerability reduction measures. 	<ul style="list-style-type: none"> • Leaders are active in preparedness committees and activities.¹ • Companies have disaster recovery plans, which have been coordinated with national and local plans. 	<ul style="list-style-type: none"> • Leaders and organizations adopt and promote the use of international standards that reduce the potential impact of disasters and accidents on the environment. • Leaders and government develop compliance standards and measures to reduce vulnerability of the environment to primary and secondary hazard impacts. • 'Seal of approval' for environmentally sound business practices exists and applied. 	
	Members	<ul style="list-style-type: none"> • Technical organizations test, make available and promote methods for strengthening structures. • In private contracts, include clauses for the use of specific standards by designers and constructors. • Businesses conduct structural assessments of facilities, undertake hazard-resistant retrofit as required. • Community residents with appropriate skills provide information and services to identify and solve structural deficiencies. • Appropriate building materials available. 	<ul style="list-style-type: none"> • Appropriate building materials are available for sale. • Companies identify and promote non-structural mitigation measures, offer demonstrations. <i>Low-cost options are offered by volunteers.</i> • Insurance premium reductions available for applications of hazard-resistant building and retrofitting techniques. Businesses negotiate insurance contracts in advance of project design, taking into account standards and independent reviews of compliance. 	<ul style="list-style-type: none"> • Specialized businesses (tourism, environmental cleanup) have coordinated response actions with the government. • Businesses have tested disaster plans, developed based on local hazard information. <i>Plans include preparations to secure employees' homes and families. Inventories adjusted in recognition of seasonal threats</i> 	<ul style="list-style-type: none"> • Technical organizations promote training and research to reduce environmental impacts. • Business/industry publicly communicates its environmental awareness and practices, including risk reduction measures. 	<ul style="list-style-type: none"> • Companies review and adjust inventory levels, appropriate to seasonal disaster threats. • Companies have disaster recovery plans that strive for rapid re-opening of business and include both on-site and off-site considerations. • Appropriate building materials (straps, screws, washers, galvanize of sufficient gauge) available, with proper installation instructions.

¹ See, for example, guidelines at the Center for International Disaster Information (<http://www.cidi.com/>).

Table 2: Risk Reduction – Good Practices

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
Subregional					
<i>OECS Framework</i>		<ul style="list-style-type: none"> • Model planning legislation contains provisions for avoidance of hazardous areas and promotion of environmental management. <i>OECS Secretariat supports harmonization of planning legislation and common guidelines in environmental management.</i> • Vulnerability assessment and reduction techniques included in curricula of universities and technical training institutions. • Promote consistency of development and maintenance of building standards. 	<ul style="list-style-type: none"> • A sub-regional tropical cyclone warning system is operational and provides warnings to OECS countries. 	<ul style="list-style-type: none"> • Sound environmental policies and practices standardized. 	
<i>Inter-Country Collaboration</i>			<ul style="list-style-type: none"> • Mutual assistance protocols between neighbors are in place. 		
Regional					
<i>Regional Institutions</i>		<ul style="list-style-type: none"> • All countries have disaster management legislation. <i>CDERA provides support to countries in preparing disaster mitigation legislation.</i> • Provide mechanisms for ongoing hazard research and for development and maintenance of regional building standards. • Vulnerability reduction included in university and technical institution curricula. 	<ul style="list-style-type: none"> • Provide mechanism for post-event diagnostic surveys to determine causes of failures and reasons for successes. 	<ul style="list-style-type: none"> • Model disaster legislation contains environmental elements. 	<ul style="list-style-type: none"> • Conduct and disseminate results of post-event diagnostic surveys to determine causes of failures and reasons for successes.
<i>Multilateral Lending Institutions, Bilateral Donors</i>		<ul style="list-style-type: none"> • Disbursement of funds for all capital works conditional on certified compliance with agreed regional standards. 		<ul style="list-style-type: none"> • Environmentally sound practices (particularly in relation to hazards) used in all operations and national/regional assistance strategies. 	<ul style="list-style-type: none"> • Lending Agencies apply explicit risk reduction conditions in post disaster recovery lending. <i>Funding provided for repairs only if demonstrated improvements are made to damaged facilities.</i>

Table 3: Risk Transfer – Good Practices

Entries in the matrix include both good practices outcomes and instruments. Good practices outcomes indicate the desired state or objective and are designated by bullets (•) and plain text. Good practices instruments are technical and institutional mechanisms that need to be deployed to reach the desired outcome; instruments are described in *italics*.

		Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society <i>(Communities and their organizations)</i>		<ul style="list-style-type: none"> Housing-related NGOs offer hurricane-resistant home improvement programs with revolving loan financing that include vulnerability reduction and attention to building standards. Churches and community organizations establish contingency funds. 	<ul style="list-style-type: none"> All residential and commercial properties are insured to actual value. <i>Legislation mandating insurance for properties valued above certain thresholds.</i> Operators of hurricane-resistant home improvement programs organize group insurance programs for participants in their programs. 			<ul style="list-style-type: none"> Promote and implement risk reduction measures to reduce the need for risk financing.
Local government	Policy					
	Technical					
Local Disaster Committees						

Table 3: Risk Transfer – Good Practices

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<ul style="list-style-type: none"> Government allocates contingent disaster funding in its annual budget, based on actuarial probabilities. Government encourages, through tax incentives, the creation of private catastrophe reserves. 	<ul style="list-style-type: none"> The insurance regulatory function is adequately empowered and funded, with trained staff for controlling insurers' fiscal health and catastrophe peril liabilities. The insurance regulator oversees the implementation of hazard maps governing insurers' levels of catastrophe peril liabilities. Catastrophe peril premium pricing levels recognize individual risk characteristics. 'Catastrophe Loss Trust Fund' mechanism established, with insurer contributions required. Simplified insurer classification system, based on international good practice, devised and implemented. 	<ul style="list-style-type: none"> Policy decision to insure public properties to reduce fiscal risk. <i>Start with insuring key economic assets, within budget constraints.</i> Insurance of public assets, to minimize fiscal risks, put into effect.² <i>Pooling would provide lower insurance price contracts. Also see sub-regional approach below.</i> Public fund or mechanism established to indemnify poor, with preference for individuals who undertook mitigation measures. <i>Mechanism to include funds for vulnerability reduction measures.</i> 	<ul style="list-style-type: none"> Public insurable assets aggregated under one policy.³ 	<ul style="list-style-type: none"> Governments have taken on some external credits including IBRD/IDA to support reconstruction and mitigation for disaster events. <i>Additional contingent credit facilities should also be considered to supplement budgets and to have liquidity on hand.</i>
	Technical					
National Disaster Office		<ul style="list-style-type: none"> Pre-funded contingent budgets for emergency response and loss reduction exist. <i>Emergency funds are deployed according to contingency plans, including for advance vulnerability reduction actions.</i> 	<ul style="list-style-type: none"> NDO promotes risk reduction for insurability purposes. 			
Business and Industry	Leaders	<ul style="list-style-type: none"> Insurers, lenders, Chamber of Commerce and community leaders form Advisory Council to insurance regulator with the aim of promoting good insurance practices for catastrophe perils and vulnerability reduction methods. 	<ul style="list-style-type: none"> Insurance companies develop and promote schemes that provide incentives for risk reduction. 	<ul style="list-style-type: none"> Public autonomous enterprises are generally insured with private insurers. <i>Pooling methods may be more appropriate and less expensive for other public assets.</i> 	<ul style="list-style-type: none"> Industry-specific (e.g. tourism, energy) mechanisms for risk pooling and financing established.⁴ 	<ul style="list-style-type: none"> Alternative risk financing mechanisms, such as loan financing and finite insurance available to assist companies recover from hazard events.

² Example: Barbados Power and Light.

³ Excludes infrastructure, such as energy facilities and airports, that are covered under specialized policies.

⁴ Develop regional industry-specific pools, where regional trade organizations exist.

Table 3: Risk Transfer – Good Practices

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<ul style="list-style-type: none"> Enterprises maintain a high savings rate, for general self-insurance purposes. 	<ul style="list-style-type: none"> Private commercial properties are insured to actual value. <i>Legislation mandating insurance for properties valued above certain thresholds.</i> Private firms purchase business interruption insurance, as appropriate, to include compensation for employees. 			
Subregional						
	<i>OECS Framework</i>		<ul style="list-style-type: none"> The common insurance legislation presently under development implemented across the region. <i>Legislation should promote, among other norms, additional risk retention and capital self sufficiency to prevent over-leveraging of reinsurance and associated price volatility, which affects the development of the industry nationally.</i> 	<ul style="list-style-type: none"> Application of insurance arrangements for public asset coverage to be piloted using sub-regional pooling of assets supported by the World Bank. <i>Currently no such arrangements in place.</i> 	<ul style="list-style-type: none"> Mechanism established at the OECS level for risk pooling to allow the efficient coverage of public assets and potentially private assets. 	<ul style="list-style-type: none"> The use of contingent credit as a supplementary instrument to market reinsurance should be considered, to reduce price volatility and maintain backstop capital. <i>Such arrangements, coupled with pooling, permit an upscaling of volume to more significant levels, for otherwise very small country risk portfolios.</i>
	<i>Inter-Country Collaboration</i>		<ul style="list-style-type: none"> Efficiencies of operation and further consolidation of the industry pursued through integration under branch operation, to improve its viability and penetration. 			

Table 3: Risk Transfer – Good Practices

	Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Regional					
<i>Regional Institutions</i>	<ul style="list-style-type: none"> • Capital contributions to Caribbean Development Bank help to ensure availability of post-disaster financing. 	<ul style="list-style-type: none"> • Regional body of insurance regulators established and empowered to develop harmonized risk classification criteria for the region. • Insurance Association of the Caribbean (IAC) promotes harmonization of insurance legislation and documentation within the region and structural risk reduction advocacy by membership. • Oversight role of the IAC revitalized. • Market-based insurance rating agency established to evaluate fiscal health of primary insurance companies and common re-insurers. 		<ul style="list-style-type: none"> • CARICOM Secretariat to promote risk pooling and diversification at the regional level. • Regional associations (e.g. CHA, CARILEC) to promote risk pooling and diversification at the regional level. 	<ul style="list-style-type: none"> • Tax deductibility of risk reserve funds harmonized regionally.
<i>Multilateral Lending Institutions, Bilateral Donors</i>		<ul style="list-style-type: none"> • Multi-lateral agencies support harmonization and strengthening of insurance supervision across the region. 		<ul style="list-style-type: none"> • Risk pooling efforts implemented at OECS level, as potential pilot for Regional arrangements.⁵ • Multi-lateral institutions support regional risk pooling efforts. 	

⁵ World Bank project to serve as guide.

ANNEX 2: SUMMARY OF RISK MANAGEMENT GOOD AND ACTUAL PRACTICES

A. Risk Identification

Local level	
Good Practice	Actual Practices and Gaps
COMMUNITY/CIVIL SOCIETY	
<p><i>Hazard Mapping</i></p> <ul style="list-style-type: none"> ▪ Prevalent hazards are studied and areas subject to the effects of the hazards are mapped. ▪ Easy to use hazard maps are publicly available for all significant hazards. 	<p><i>Eastern Caribbean</i></p> <ul style="list-style-type: none"> ▪ Comprehensive series of hazard maps recently developed in Antigua/Barbuda and St. Kitts/Nevis. These maps have been presented publicly. In Antigua/Barbuda, national-scale maps have been distributed to local disaster committees. ▪ Flood hazard maps are available to communities in St. Lucia. ▪ Generally, communities have little access to hazard maps. <p><i>Jamaica</i></p> <ul style="list-style-type: none"> ▪ Community groups in Portland trained in use of hazard maps. ▪ UWI is developing atlases for use by small communities to inform home building and purchase (initially in Kingston/St. Andrew). ▪ Generally, communities have little access to hazard maps. <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> ▪ Maps for selected hazards available in communities, where they have been developed as part of a time-limited project or where developed by a local disaster committee. Digital information at the national level not available to communities or not available at appropriate scales.
<p><i>Vulnerability and Risk Assessment</i></p> <ul style="list-style-type: none"> ▪ Communities are aware of their vulnerabilities. ▪ Vulnerable housing and public facilities located in hazard zones identified. ▪ Community groups are aware of the link between environmental quality and vulnerability, and monitor the local environment for degradation. ▪ Local disaster committees have identified highly vulnerable development and infrastructure and convey this information to government. ▪ Highly vulnerable groups, settlements and facilities identified. 	<p><i>Eastern Caribbean</i></p> <ul style="list-style-type: none"> ▪ Community vulnerability awareness varies with hazard impact history. ▪ Some housing and public facilities can be found in hazardous areas throughout the sub-region. Schools located in vulnerable locations have been identified in Antigua/Barbuda, Dominica, St. Lucia and St. Kitts/Nevis. Critical facilities generally located in vulnerable locations identified in Antigua/Barbuda, the BVI and St. Kitts/Nevis. ▪ Knowledge of the links between environmental quality and hazards is growing. Reported to be strong in Antigua/Barbuda and St. Kitts/Nevis. ▪ Disaster committees are active in most countries, although mechanisms for channeling information to national-level agencies are weak. In the BVI and St. Vincent, committees assist with shelter vulnerability assessments. <p><i>Jamaica</i></p> <ul style="list-style-type: none"> ▪ Communities assist the disaster office with identification of vulnerable groups and with maintenance of information on emergency shelters. ▪ Disaster committees have been established in most, but not all communities. <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> ▪ Most population groups are generally aware of at least part of their vulnerability; addressing poverty and other socio-economic problems seen as more important than hazards. ▪ Training of groups to identify and protect environmental systems contained in proposed environmental legislation. ▪ Many highly vulnerable settlements and infrastructure components have been identified, but lack of resources or commitment has impeded the development and implementation of an action plan.

Local level	
Good Practice	Actual Practices and Gaps
LOCAL GOVERNMENT	
<p><i>Hazard Mapping</i></p> <ul style="list-style-type: none"> ▪ Hazard maps developed and distributed. ▪ Critical facility inventories compiled and made available. 	<p><i>Eastern Caribbean</i></p> <ul style="list-style-type: none"> ▪ Local governments do not exist in most Eastern Caribbean states. ▪ Comprehensive critical facility inventories have been completed in Antigua/Barbuda, the BVI and St. Kitts/Nevis ▪ In St. Lucia, the Castries City Council has assumed some local disaster management functions, including shelter assessments. <p><i>Jamaica</i></p> <ul style="list-style-type: none"> ▪ Maps and facility inventories completed for selected parishes (e.g. Portland) <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> ▪ Maps for selected hazards available in communities, where they have been developed under time-limited projects or by local disaster committees. Digital information at the national level not available to communities or not available at appropriate scales. ▪ Inventories of critical facilities generally not comprehensively compiled or available.
<p><i>Vulnerability and Risk Assessment</i></p> <ul style="list-style-type: none"> ▪ Vulnerable public facilities, including emergency shelters, identified. Facility uses appropriate to facility vulnerability. ▪ Gaps in development controls allowing development in hazardous areas identified. ▪ Causes of hazard-related damage are studied and remedies are broadly disseminated. ▪ Local-level risk maps are available, and local development decisions based on risk information. 	<p><i>Eastern Caribbean</i></p> <ul style="list-style-type: none"> ▪ Development control and critical facility management is carried out by the central government. ▪ Vulnerability assessments not typically available to guide decisions about proper and safe use of facilities. ▪ Post-disaster assessments not used extensively. <p><i>Jamaica</i></p> <ul style="list-style-type: none"> ▪ Post-disaster assessments carried out for major events. Studies used to guide post-disaster community development activities (Portland). ▪ Communities assist with shelter assessments. <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> ▪ Physical vulnerability information not available for the great majority of structures. ▪ Most development not subjected to development controls. ▪ Causes of damage not typically studied.

National level

Good Practice**Actual Practices and Gaps**

GOVERNMENT

Hazard Mapping

- Hazard mapping procedures and mechanisms developed and initiated. Information collected is made widely available. Disaster office promotes its use in public and private sector investment decisions.

Eastern Caribbean

- Hazard mapping activities typically undertaken as part of post-disaster response or as a component of focused projects, presenting difficulties in integrating separate hazard maps. Assessments often undertaken by external consultants, with limited local capacity building.
- A full hazard map series has been developed for the BVI.

Jamaica

- Mapping initiatives within the central government and NEPA include the development of map standards. The disaster office refers to and promotes the use of available hazard info.
- Hazard maps exist for portions of the country for storm surge, landslide, seismic and flood hazards.

Dominican Republic

- Adequate maps of rain hazards exist. Wind hazard maps require updating and seismic hazard maps are inadequate. Digital orthophotography is newly available. Disaster office has proposed legislative package to promote the use of hazard information for development and investment decisions. Hazard information not easily accessible.

Vulnerability and Risk Assessment

- Highly vulnerable populations groups, facilities and locations identified. Risk reduction actions prioritized based social, economic and environmental impacts.
- Hazard vulnerability self-assessment techniques and environmental indicators made available for use by local groups. Local findings based on these incorporated into government programs.
- Government programs across all sectors incorporate hazard awareness and risk management.
- Government maintains and uses a current inventory of critical facilities, which includes assessments of vulnerability.

Eastern Caribbean

- Information on vulnerable population groups and facilities available, but use of this information to prioritize risk management interventions is limited.
- Mechanisms for hazard self-assessment and environmental monitoring not widely available and environmental systems are generally not well protected. St. Kitts/Nevis has conducted community level training on land degradation.
- Hazard awareness and risk management not well integrated into government programs outside of disaster management.
- In the BVI, vulnerability assessments conducted under the Hazard and Risk Assessment Study.

Jamaica

- Environmental indicators developed and tracked at the national level.
- Government lacks a comprehensive inventory of critical facilities.

Dominican Republic

- Disaster office has identified vulnerable settlements and infrastructure components and is seeking government resources to implement vulnerability reduction measures.
- Inventories of critical facilities not comprehensively compiled or available. The disaster office has solicited funds to inventory facilities and conduct vulnerability audits.

National level

Good Practice**Actual Practices and Gaps****BUSINESS AND INDUSTRY***Hazard Mapping*

- Business/industry and government cooperate on a formal process to identify hazardous areas and critical facilities.
- Business/industry share hazard maps and critical facility information with government and uses such information in investment decisions.
- Business/industry provide expertise to undertake vulnerability assessments.

Eastern Caribbean, Jamaica

- Hazard map information generally not widely shared between government and business/industry.
- Expertise to conduct vulnerability assessment generally available in each country.

Dominican Republic

- Private sector enterprises with international bases generally reference hazard maps in accordance with ISO standards.
- Selected enterprises, such as the oil refinery, develop and share hazard information.
- Selected private firms and organizations provide technical assistance with vulnerability assessments.

Vulnerability and Risk Assessment

- Primary hazard impacts and remedies compiled for each sector, including public and private assets.
- Safer building "seal of approval" program developed and implemented.
- Environmental impact assessments conducted, including hazard considerations.
- Insurance companies conduct and use risk assessments for their portfolios.

Eastern Caribbean, Jamaica

- With few exceptions (tourism, electrical generation), comprehensive hazard impact studies have not been undertaken for most sectors.
- Safer building certification programs do not currently exist.
- Local insurance companies do not typically have sufficient hazard and risk information available for comprehensive risk assessments of portfolios.

Dominican Republic

- Environmental standards established for development, but these are rarely enforced.
 - Strategic plans, which include hazard considerations, developed in selected communities, under time-limited projects.
-

Sub-regional, Regional and International

Good Practice**Actual Practices and Gaps****OECS SUB-REGION***Hazard Mapping*

- A central clearinghouse of information established for hazard mapping, assessment best practices and available expertise.

- No such clearinghouse currently exists

Vulnerability and Risk Assessment

- Link between development decisions, environmental degradation and hazard impacts given full consideration in sub-regional charters, model documents and policies.

- Hazard considerations prominently included in St George's Declaration of Principles for Environmental Sustainability in the OECS.
 - Model physical planning legislation and building code and guidelines address hazard concerns.
-

REGIONAL INSTITUTIONS*Hazard Mapping*

- Regional technical institutions provide mapping and assessment assistance to national governments and are provided funding for this role.

CARICOM

- Significant hazard mapping and assessment expertise exists within the University of the West Indies, but this role is not adequately funded.
-

Sub-regional, Regional and International

Good Practice*Vulnerability and Risk Assessment*

- Central banks provide modeling services for alternative disaster scenarios.
- Standard vulnerability assessment approaches documented and distributed.

Actual Practices and Gaps*CARICOM*

- Modeling services for alternative disaster scenarios not currently provided by central banks.
 - CDB to host vulnerability assessment techniques workshop in late 2002. The CDB Disaster Mitigation Facility for the Caribbean to direct development of standard methodologies.
-

MULTI- AND BI- LATERAL LENDING INSTITUTIONS AND DONORS

Hazard Mapping

- Hazard maps and information regularly used in project development and decision making.
- Hazard assessment and mapping supported in development programs.

- Hazard assessment and mapping programs regularly supported by organizations such as the World Bank, USAID and CIDA.
-

Vulnerability and Risk Assessment

- Hazard considerations incorporated into environmental assessments for other projects, particularly for critical facility development.

- Hazard considerations often not fully incorporated into project design.
-

B. Risk Reduction

Local level

Good Practice**COMMUNITIES/CIVIL SOCIETY**

Physical Measures

- Information on and displays of appropriate and inappropriate building techniques widely available.
- Communities review and question the standards of all new construction and major refurbishments.

Eastern Caribbean

- Information on appropriate building techniques have been developed and distributed in most countries, although some materials are out of print.
- Communities are often not given the opportunity to comment on new construction or refurbishments.

Jamaica

- CRDC, a Jamaican housing NGO, developed significant safer housing materials, but it is currently not active due to financial constraints.

Dominican Republic

- "Self-built construction guides" widely distributed.
 - Communities regularly question the standard of new construction and rehabilitation, typically with little effect.
-

Local level

Good Practice*Socio-economic, Environmental Measures*

- Hazard and vulnerability reduction information incorporated into school curricula.
- Poverty-related vulnerability identified and addressed.
- Mechanisms and knowledge required to identify environmental degradation developed and implemented.
- Local disaster committees established, with adequate emergency contingency plans, training and technical skills.

Post-disaster Measures

- Appropriate building materials available, with proper installation instructions.
- Communities review the standards of all repairs.

Actual Practices and Gaps*Eastern Caribbean*

- Hazard information generally not incorporated into school curricula.
- Local disaster committees established in most countries, with varying levels of activity.

Jamaica

- National environmental education curriculum established.
- Indicators of environmental degradation developed and available.
- Local disaster committees established and active in most communities.

Dominican Republic

- Ministry of Education has developed texts for various subjects to include hazard and vulnerability reduction information in the school curricula.
- Selected NGOs address the relationship between poverty and vulnerability in development projects.
- Significant strides have been taken towards the development and implementation of environmental indicators.
- Local disaster committees have been established in many communities, but are non-existent in the majority of high-risk communities.

Eastern Caribbean

- Appropriate building materials are easily available in most countries, with the exception of Grenada. In Dominica, some building materials are expensive. Proper installation instructions not always available.

Jamaica

- Appropriate building materials available at a reasonable cost.

Dominican Republic

- Appropriate building materials are generally available, but often lack proper installation instructions.
-

LOCAL GOVERNMENT*Physical Measures*

- Local public infrastructure constructed outside of hazardous areas or made resilient to hazard effects.
- No housing in hazard-prone areas or housing resilient to prevalent hazards. Relocation policies and procedures standardized, documented and disseminated.
- Building code is published and training courses are held regularly.

Eastern Caribbean

- Some housing and public infrastructure exists in hazardous locations in most countries. Hazard-resistant construction and retrofit work often lacking. Relocation policies not generally adopted.
- Updated building codes have been developed in Antigua/Barbuda, Dominica, St. Kitts/Nevis and St. Lucia. Building regulations have been adopted and are available in the BVI. A draft building code is in progress in St. Vincent. Enabling legislation must be passed to adopt most of these codes. Significant training and awareness building efforts required.

Jamaica

- Significant housing exists in hazard prone areas. Relocation policies under development for specific areas.
- Building code adopted in 1983, but is currently being revised.

Dominican Republic

- Much of the public infrastructure is currently located within hazardous areas.
 - Vulnerable housing exists in many hazardous areas throughout the country.
 - The building code is available, but the code does not reference important auxiliary documents, such as the wind and seismic codes.
-

Local level

Good Practice*Socio-economic, Environmental Measures*

- Local environmental regulations in place and enforced.

Actual Practices and Gaps*Eastern Caribbean*

- Enforcement of development and environmental controls often weak.

Jamaica

- The majority of buildings are not reviewed via the formal planning system.

Dominican Republic

- Environmental management / protection policies and programs are in place, but most are unenforced.
-

Post-disaster Measures

- Recovery plans, including budget estimates, have been developed and approved by political leaders.

Eastern Caribbean

- Few recovery plans have been developed.

Jamaica

- Over half of government agencies have disaster plans.

Dominican Republic

- Few recovery plans have been developed.
-

National Level

Good Practice**GOVERNMENT***Physical Measures*

- Building code, tailored to local hazards, is the basis for development approval. Adherence to the code is enforced. A trained building inspectorate is in place, with appropriate powers to review and control building standards.
- All new public buildings conform to appropriate building codes and standards. Appropriate technical staff in all agencies familiar with and use the building code.
- Location of housing and infrastructure is guided by land use plans that incorporate multi-hazard vulnerability reduction measures.
- Quality standards for building materials developed and enforced.

Actual Practices and Gaps*Eastern Caribbean*

- Building codes have been developed in all countries, except for St. Vincent. Code enforcement and inspection is generally weak, even where appropriate enforcement powers exist. Training courses for building inspectors have been held recently for Antigua/Barbuda and St. Kitts/Nevis.
- Most new public buildings conform to codes and standards. Government buildings in Grenada not held to code.
- Land use plans and controls are often weak.
- Standards for building materials lacking in most countries.

Jamaica

- Building code is in force, but inspection capacity is limited.
- New public buildings conform to building code.
- The majority of housing is built outside of formal land use and building control.
- The Bureau of Standards has developed standards for building materials.

Dominican Republic

- The building code is the basis for development approval, but there is little enforcement of the code. Currently both the wind and seismic codes are being upgraded. A trained building inspectorate has been proposed.
 - Designs of important facilities are reviewed, but there is typically little control over the building process.
 - The majority of development is not subject to development controls.
 - Quality standards have been developed for about half of the standard building materials, but there is little control of the quality of these materials.
-

National Level

Good Practice*Socio-economic and Environmental Measures*

- Deficiencies in infrastructure that increase vulnerability identified and enforced.
- Environmental management / protection policies include protection for natural systems that stabilize hazardous areas or mitigate hazard effects.
- Agriculture and forestry practices do not degrade protective natural systems.

Actual Practices and Gaps*Eastern Caribbean*

- Environmental management policies and measures generally weak.
- Agriculture and forestry practices often contribute to environmental degradation.

Jamaica

- Environmental protections developed.
- Impact of forestry practices on flooding and landslides under investigation.
- Environmental degradation results from agricultural, coal- and wood-fire burning and settlements.

Dominican Republic

- Many deficiencies in public infrastructure exist, but limited resources and political commitment constrain improvements.
- Environmental management / protection policies and programs are in place, but most are unenforced.
- Agriculture and forestry practices often degrade natural systems due to obsolete technology and limited enforcement of controls.

Post-disaster Measures

- Recovery plans and actions incorporate risk reduction actions.
- Standards for rehabilitation and new construction of post-disaster assets reviewed for adequacy.

Eastern Caribbean

- Few recovery plans have been developed.

Jamaica

- Over half of government agencies have disaster plans.

Dominican Republic

- Few recovery plans have been developed.
- Standards for post-disaster rehabilitation and new construction reviewed, at times, for adequacy.

BUSINESS AND INDUSTRY

Physical Measures

- Business and industry coordinate with government on common risk management concerns.
- Construction of private sector facilities conforms to building code and standards.
- Appropriate building materials available for sale.
- Technical organizations test, make available and promote methods for structural strengthening.
- Hazard information used for development decisions.
- Public materials and advertising support and demonstrate vulnerability reduction measures. Incentives provided for safer construction.

Eastern Caribbean, Jamaica

- Business and industry represented on disaster coordination mechanisms in a number of countries.
- Private sector facilities typically conform to building codes, particularly when built with mortgage funds.
- Appropriate building materials generally available (except Grenada)
- Some insurance agencies and building materials suppliers promote safer building activities.
- In Jamaica, some private firms, such as the Grace Kennedy group, regularly assess the vulnerability of their buildings and structures.

Dominican Republic

- Construction by private sector enterprises with international bases conforms to building code and standards.
- Appropriate building materials available for sale, but often without installation instructions.
- Selected large corporations and enterprises regularly use hazard information for development decisions.
- Selected corporations and insurance companies develop materials for and promote vulnerability reduction measures.

National Level

Good Practice*Socio-economic and Environmental Measures*

- International standards that reduce the impact of disasters and accidents on the environment adopted and promoted.
- "Seal of approval" for environmentally sound business practices developed and implemented.
- Business and industry public communicate environmental awareness and practices, including risk reduction measures.

Post-disaster Measures

- Companies review and adjust inventory levels, appropriate to seasonal disaster threats.
- Companies have disaster recovery plans that strive for rapid reopening of business and include both on-site, off-site and employee considerations.

Actual Practices and Gaps*Eastern Caribbean, Jamaica*

- Seal of approval programs not currently instituted.

Dominican Republic

- Most private sector enterprises with international bases follow international guidelines (such as ISO) which incorporate environmental protection measures.

Eastern Caribbean

- Only building materials suppliers and hotels typically adjust inventory levels according to seasonal disaster threats.

Dominican Republic

- Just-in-time setup and the availability of shipping containers has more impact on inventory levels than do seasonal disaster threats.
 - Most larger private sector enterprises with international bases have designed and implemented some contingency planning.
-

Sub-regional, Regional and International

Good Practice

OECS SUB-REGION

Physical Measures

- Model planning legislation contains provisions for avoidance of hazardous areas and promotion of environmental management.
- Vulnerability assessment and reduction techniques included in curricula of technical training institutions.
- Planning legislation, environmental management legislation and building standards harmonized.

Actual Practices and Gaps

- Technical training institutions construction programs include safer building techniques.
 - National and regional planning, environmental legislation and building standards need further harmonization.
-

Socio-economic and Environmental Measures

- Mutual assistance protocols in place between neighbors.
 - Sound environmental policies and practices standardized.
-

Sub-regional, Regional and International

Good Practice**Actual Practices and Gaps**

REGIONAL INSTITUTIONS

Physical, Socio-economic and Environmental Measures

- All countries have disaster management legislation, incorporating environmental elements.
- Mechanisms for ongoing hazard research and for maintenance of regional building standards developed.
- Vulnerability assessment and reduction techniques included in curricula of universities and technical training institutions.
- Mechanisms for post-event diagnostic surveys to determine causes of failures and reasons for successes developed and implemented.

CARICOM

- Disaster management legislation under development in most countries, with assistance from CDERA.
- Standard mechanisms for post-event diagnostic surveys not currently in place. CDERA documented best practices in recovery efforts after hurricane Lenny. ECLAC has developed useful surveys for post-event economic impact assessment.

Post-disaster Measures

- Post-event diagnostic surveys conducted to determine causes of failures and reasons for success. Results disseminated broadly.

CARICOM

MULTI- AND BI-LATERAL LENDING INSTITUTIONS AND DONORS

Physical, Socio-economic and Environmental Measures

- Disbursement of funds for all capital works conditional on certified compliance with agreed regional standards.

- Disbursement of funds often not contingent on compliance with building standards.

Post-disaster Measures

- Lending agencies apply explicit risk reduction conditions in post-disaster recovery lending.

- Post-disaster recovery lending often focused on rapid recovery, rather than risk reduction.
-

Local level	
Good Practice	Actual Practices and Gaps
COMMUNITIES/CIVIL SOCIETY	
<p><i>Self- and Market Insurance</i></p> <ul style="list-style-type: none"> All residential and commercial properties insured to actual value. Housing-related NGOs offer hurricane-resistant home improvement programs. Group insurance programs available to participants. 	<p><i>Eastern Caribbean and Jamaica</i></p> <ul style="list-style-type: none"> Commercial properties with remaining mortgage balances typically insured. Many middle and upper income properties insured. The majority of lower income properties are not insured and many are uninsurable. There is no compulsory insurance coverage. Hurricane-resistant home improvement programs exist in selected countries. Group insurance programs generally not available for lower income groups, St. Lucia excepted. <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> Few residential and commercial properties are insured or only insured to the remaining balance of the loan. Hurricane-resistant home improvement programs offered in selected communities through limited-term projects.

National Level	
Good Practice	Actual Practices and Gaps
GOVERNMENT	
<p><i>Self- and Market Insurance</i></p> <ul style="list-style-type: none"> Government allocates contingent disaster funding in annual budget, based on actuarial probabilities. Insurance regulatory function is adequately empowered and funded, with trained staff. Insurance regulator oversees implementation of hazard maps governing insurers' level of catastrophe peril liabilities. Simplified insurer classification system, based on international best practices, devised and implemented. National disaster office promotes risk reduction for insurability purposes. 	<p><i>Eastern Caribbean and Jamaica</i></p> <ul style="list-style-type: none"> Governments do not typically allocate contingent funds, although some countries have funds available at the Central Bank for contingencies. Insurance regulatory function exists and is staffed, but typically staff lacks appropriate training. Insurance regulators do not have available hazard maps for reviewing catastrophe peril liabilities. Insurer classification system not implemented or consistent. Disaster offices promote risk reduction, but not typically for insurability purposes. <p><i>Dominican Republic</i></p> <ul style="list-style-type: none"> Government does not currently allocate contingent disaster funds. Legislation proposing this is pending. The insurance regulatory function is adequately empowered, with trained staff. The insurance regulator does not oversee implementation of hazard maps used for assessing catastrophe liabilities. Work is currently underway with international rating company to develop a new insurance classification system.

National Level

Good Practice

Public Asset Coverage and Pooling

- Government makes policy decision to insure critical public properties to reduce financial risk. Risk pooling used to lower insurance price contracts.
- Public fund or mechanism established to indemnify poor, with preference for individuals who have undertaken risk reduction measures.

Risk Financing

- Government has taken on some external credits to support reconstruction and mitigation for disaster events.

Actual Practices and Gaps

Eastern Caribbean and Jamaica

- Typically only selected government facilities insured. St. Kitts/Nevis has made policy decision to cover all assets. Risk pooling not typically used.
- No public fund/mechanism exists to indemnify poor.
- Properties owned by statutory bodies often insured.

Dominican Republic

- Government does not insure all critical public properties. Proposed legislation would require budget reserves to insure public facilities.
- No public fund/mechanism exists to indemnify poor.

Eastern Caribbean and Jamaica

- Most governments do source external credit for reconstruction and mitigation efforts, typically from commercial lenders.

BUSINESS AND INDUSTRY

Self- and Market Insurance

- Insurers, lenders, and community leaders form advisory council to the insurance regulator.
- Enterprises maintain a high savings rate, for general self-insurance purposes.
- Insurance companies develop and promote schemes that provide risk reduction incentives.
- Private commercial properties insured to actual value and companies purchase business interruption insurance, as appropriate, to include coverage for employees.

Eastern Caribbean and Jamaica

- Insurance advisory councils do not currently exist.
- Self-insurance is often limited due to fiscal constraints.
- An increasing number of insurance companies have developed and promote schemes that provide risk reduction incentives.
- Private commercial properties covered by commercial mortgages typically insured. A limited number of companies purchase business interruption insurance and employees are not typically covered in these policies.

Dominican Republic

- Representative of private insurance companies participate on an insurance advisory board.
- Generally, companies do not maintain savings for self-insurance purposes.
- Insurance companies often provide technical assistance to clients for risk reduction.
- Private sector enterprises with international bases typically have insurance coverage.

Public Asset Coverage and Pooling

- Public autonomous enterprises are generally insured with private insurers, with risk pooling used where available.
- Industry-specific mechanisms for risk pooling and financing established.

Eastern Caribbean and Jamaica

- Public autonomous enterprises are generally insured.
- Risk pooling rarely used.

Dominican Republic

- Public autonomous enterprises do not generally insure their assets.
- Private sector enterprises with international bases typically participate in worldwide policies that cover assets and activities in the Dominican Republic.

Risk Financing

- Alternative risk financing mechanisms, such as loan financing and finite insurance, available to assist companies recover from hazard events.

Eastern Caribbean and Jamaica

- Alternative risk financing mechanisms rarely used.

Dominican Republic

- Alternative risk financing mechanisms rarely used.
-

Sub-regional, Regional and International

Good Practice**Actual Practices and Gaps**

OECS SUB-REGION

Self- and Market Insurance

- Common insurance legislation implemented across the region.

OECS

- Common insurance legislation is under development.
-

Public Asset Coverage and Pooling

- Mechanism established at OECS level for risk pooling to allow efficient coverage of public, and potentially private, assets.

OECS

- World Bank has developed a proposal for such a mechanism.
-

Risk Financing

- The use of contingent credit as a supplementary instrument to market insurance considered.
-

REGIONAL INSTITUTIONS

Self- and Market Insurance

- Regional body of insurance regulators established and empowered to developed harmonized risk classification criteria.
- Insurance Association of the Caribbean (IAC) promotes harmonized legislation and documentation.
- Market-based insurance rating agency established to evaluate fiscal health of primary insurance companies and common reinsurers.

CARICOM

- No common insurance legislation in effect in the region. Caribbean Association of Insurance Regulators (CAIR) established, but its activities are severely limited by financial difficulties.
 - IAC promotes harmonization, but with limited success (exceptions: Jamaica, Barbados, Trinidad/Tobago)
-

Public Asset Coverage and Pooling

- Risk pooling and diversification promoted at the regional level by CARICOM and within individual sectors by regional trade associations.

CARICOM

- A proposal for a regional risk pool mechanism has been developed by the World Bank.
 - Regional bodies have promoted risk pooling, but with limited effect.
-

Risk Financing

- Tax deductability of risk reserve funds harmonized regionally.
-

MULTI- AND BI-LATERAL LENDING INSTITUTIONS AND DONORS

Self- and Market Insurance

- Multi-lateral agencies support harmonization and strengthening of insurance supervision across the region.

Public Asset Coverage and Pooling

- Multi-lateral institutions support regional risk pooling efforts.
-

**ANNEX 3: ASSESSMENTS OF RISK MANAGEMENT
ACTUAL PRACTICES**

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

ANTIGUA AND BARBUDA

Antigua and Barbuda
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society <i>(Communities and their organizations)</i>		<p>Hazard maps prepared for drought, hurricanes, wind, flood, and earthquake hazards.</p> <p>Persons in community with historical knowledge used to supplement scientific studies to identify hazards and vulnerable areas.</p> <p>Crabb Hill, Grays Green and Liberta communities trained to identify hazard risks and how to deal with them at local level. Some community training also completed in Barbuda</p> <p><i>Training in identification of hazards and dealing with them not yet conducted in all communities.</i></p>	<p>Caribbean Conference of Churches working with NODS to advance mitigation in a pilot project in Crabb Hill</p> <p>Discussions with Antigua & Barbuda Hotel Association to help disseminate hazard information.</p> <p>Vulnerable groups identified in Antigua and Barbuda.</p> <p><i>Much existing housing and development, including critical facilities and infrastructure, already exists in vulnerable areas.</i></p> <p><i>Inappropriate use of some emergency shelters due more to cultural traditions rather than lack of public information.</i></p>	<p>Inventory of critical facilities undertaken and most important assessed in detail.</p> <p>NODS working with Public Works to assess remaining critical facilities and identify remedial work needed.</p> <p>Damage history compiled for critical facilities under PGDM.</p>	<p>Individuals in communities have valuable knowledge of protective value of environmental systems and historical information of how they function during actual hazard events.</p> <p>Local knowledge communicated to national institutions via the District Disaster Committees and relationships with workers in key departments like Fisheries and Environment.</p> <p>Community groups trained to recognize legal extent of Environment Division's responsibilities.</p> <p><i>Lack of formal training for community groups to identify and protect critical environmental systems.</i></p>	
Local Government	Policy					
	Technical	<p>Hazard maps completed in 2001, also available to Barbuda Council.</p>		<p>Inventories of critical facilities completed in 2001 as part of comprehensive hazard vulnerability assessment done under the PGDM and available to Barbuda Council.</p> <p>Structural Vulnerability assessments done for selected government facilities in Antigua and Barbuda under the PGDM.</p>		
Local Disaster Committees		<p>District Disaster Committees in Antigua and Barbuda all provided with hazard maps for their areas. Some training done in use of the maps.</p>	<p>Disaster committees in Antigua and Barbuda identified vulnerable groups.</p>			

Antigua and Barbuda
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
Central Planning and Sectoral Agencies	Policy	National Mitigation Council established and chaired by Minister of Planning and Implementation.	<i>Government agencies not yet prioritizing mitigation measures. NODS to meet with agencies to achieve this and get them to budget for these measures and submit to Ministry of Finance and National Mitigation Council.</i>	Hazard maps used in conducting Development Potential and Site Suitability analyses and to identify areas suitable for built development. National Physical Development Plan and St. John's Local Plan provide policy guidance for steering development away from hazard prone areas. <i>Hazard vulnerability assessments not incorporated into project appraisal process.</i>	<i>Inadequate monitoring of environmental quality.</i>	Barbuda Council provided with hazard maps for Barbuda. Development standards applicable to Barbuda. NPDP provides guidance for location of development in Barbuda.
	Technical	National Mitigation Technical Committee established. Hazard maps prepared by local and foreign consultants. Development Control Authority (DCA) incorporated maps into GIS database. <i>Hazard mapping done largely by foreign consultants with limited opportunity for transfer of technical skills.</i> <i>Technical officers with some hazard mapping skills in DCA but professional staff not adequately trained to initiate and guide their work.</i>	Agricultural Extension Officers assist farmers to identify practices that degrade the environment and appropriate mitigation measures.	Repairs carried out on majority of critical facilities (CF). Some CFs abandoned because of severity of damage. Development standards prepared for hazard resistant construction. Standards widely disseminated via 'Build Strong' pamphlet. Major sectoral agencies provided with hazard maps (Environment, Fisheries, Agriculture, DCA). Public works will get when their computers upgraded and Finance requested only database. Structural vulnerability assessments done for selected government facilities in Antigua and Barbuda under PGDM. <i>Support for appropriate development standards not widespread.</i> <i>Many development projects bypass the regulatory agencies and are not subject to required scrutiny.</i>		<i>Government agencies do not maintain current inventories of physical assets besides buildings.</i>

Antigua and Barbuda
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National Disaster Office		<p>NODS prepared 'Build Strong' pamphlet and conducted workshops on Building Code for Inspectors, contractors and builders.</p> <p>NODS made hazard maps available to major sectors of government, according to their needs.</p> <p>NODS is in discussions with Hotel Association for their assistance in disseminating hazard information to their members.</p> <p>NODS using media and calypsonians to help promote public awareness.</p>	<p>NODS identified vulnerable communities and priorities areas for training.</p> <p>Vulnerability reduction strategies implemented in some vulnerable communities.</p>	<p>NODS maintains database of critical facilities and vulnerability assessments. Further analysis of other important buildings and structures continuing with assistance from PWD.</p>		
Business and Industry	Leaders	<p>NODS attempting to establish working relationship with new leadership of Chamber of Commerce.</p> <p>Hotel Association assists in identifying facilities critical to economy.</p> <p><i>Important commercial sector in St. John's as yet has no formal process for identifying facilities and services critical to economic development and interventions to be taken during and after a hazard event.</i></p>		<p><i>Hazard implications and remedies not compiled for sectors.</i></p> <p><i>Less than 10 percent of commercial businesses carry business interruption insurance.</i></p>	<p>Some attempt to protect environmental systems by some developers.</p> <p>EIAs carried out by some developers (often reluctantly) when requested by the DCA or Environment Division.</p>	
	Members	<p>Insurance companies request access to hazard maps, but for use in setting premiums according to area's vulnerability. NODS resists.</p> <p><i>Hazard maps not regularly used in decision making.</i></p>			<p><i>Many businesses less concerned with environmental issues than with financial bottom line.</i></p> <p><i>EIAs often viewed as an additional development cost that developers should not have to incur.</i></p>	

Antigua and Barbuda
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
<i>Civil Society (Communities and their organizations)</i>		<p>Examples of hazard resistant construction by private sector and individual developers.</p> <p>Habitat for Humanity housing programmes incorporate building techniques.</p> <p>Individual builders sufficiently sensitized now to request confirmation from NODS that structural details proposed by their engineers meet Code requirements.</p>	<p>Appropriate hazard resistant construction techniques available to builders and are widely used.</p> <p>NODS plans to train members of District Disaster Committees as monitoring officers.</p> <p><i>Patterns of land ownership may be a factor in causing people to build in vulnerable areas despite knowledge of vulnerability.</i></p>	<p>Hazard and vulnerability reduction information incorporated into programmes at the State College, Technical and Vocational Training Centre and the Youth Skills programme.</p> <p><i>Hazard and vulnerability reduction information not yet infused into curriculum of primary and secondary schools.</i></p>		<p>Appropriate building materials available commercially.</p>
<i>Local Government</i>	<i>Policy</i>					
	<i>Technical</i>					
<i>Local Disaster Committees</i>				<p>Local disaster committees in Antigua and Barbuda have general disaster plans that emphasize preparedness and response. NODS now focusing on helping them to develop a mitigation component, especially mitigation measures that can be taken on by the communities.</p> <p><i>Community disaster plans lack mitigation component.</i></p>		

Antigua and Barbuda
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p>New public buildings constructed in accordance with Building Code.</p> <p><i>Insufficient attention to location and vulnerability criteria in siting infrastructure.</i></p>	<p>Conformity with Building Code and location criteria increasingly important in granting development approvals.</p> <p>Building inspectors from DCA and PWD trained in use and importance of Building Code and Standards and location criteria.</p> <p>Increased monitoring of development in vulnerable areas by DCA inspectors.</p> <p>Rudimentary attempts made to incorporate hazard maps and vulnerability assessments into site suitability analyses during preparation of the National Physical Development Plan to identify areas (un)suitable for built development.</p> <p>Antigua and Barbuda Draft Natural Hazard Mitigation Policy and Plan prepared under PGDM in 2001.</p> <p><i>Lack of approved National and Local Physical Development Plans to provide legal backing for locational policies.</i></p> <p><i>Inadequate legislative framework for physical planning. Need to approve and adopt Draft Physical Planning Bill and EIA regulations.</i></p> <p><i>The planning system does not now cover Barbuda which as no development control process. The council wants to implement building standards but lacks the institutional capacity to do so.</i></p> <p><i>The Building Inspector on the Barbuda Council deals only with inspection of public—not private—buildings.</i></p>	<p>Infrastructure deficiencies identified in National Physical Development Plan and St. John's Plan.</p>	<p>Policies developed for protection of environmental systems like reefs, mangrove, sand dunes and beaches.</p> <p>Attempts to use EIAs as tool for decision making in projects with potential environmental impacts becoming more widespread.</p> <p><i>EIAs are not a legal requirement for developers until draft new planning legislation is approved.</i></p> <p><i>Lack of proper environmental monitoring system in Barbuda.</i></p>	<p>Post disaster actions incorporate reduction measures.</p> <p>Sources of finance available for post disaster recovery from regional institutions at lower interest rates and local sources such as Insurance Companies.</p> <p>Housing improvement loans available from some local financial companies and credit unions provided there is a mitigation component e.g. use of hurricane straps.</p>

Antigua and Barbuda
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	Technical	<p>Technical staff in major agencies trained in use of Building Code and have ready access to Code.</p> <p><i>Inadequate monitoring and interventions by DCA.</i></p>	<p>Some training conducted under PGDM to provide staff with skills for proper enforcement of development standards.</p> <p><i>Insufficient training and budget for enforcement of development and environmental standards in Antigua and in Barbuda.</i></p>	<p><i>Lack of dialogue between key technical agencies in Antigua and personnel on the ground in Barbuda.</i></p>		<p>Study of the effects of Hurricane Luis on the Antigua Public Utilities Authority conducted under the CDMP.</p>
National Disaster Office				<p>Some technical expertise available.</p>		<p>NODS reviews standards for post-disaster rehabilitation and new construction.</p>
Business and Industry	Leadership	<p>Construction industry working with NODS to ensure quality control of imported building materials and to adopt better practices for storing materials.</p>		<p><i>Many businesses do not deposit copies of their disaster plans with NODS and question the authority of NODS to request them.</i></p> <p><i>Disaster plans prepared by hotels are at best hurricane plans and not considered to be adequate by NODS.</i></p> <p><i>Businesses do not have recovery plans.</i></p>		
	Members		<p>Appropriate building materials available for sale nationally.</p> <p>Some construction related companies conduct public workshops to demonstrate appropriate techniques.</p> <p>Individual insurance companies employ officers to inspect buildings to ensure conformity with Code/Standards before insuring them.</p> <p>Some insurance companies use checklist to encourage potential clients to implement risk reduction measures. Conformity to Code can result in premium reductions of up to 40 percent.</p> <p>Commercial businesses put aside funds to finance recovery efforts and repair damage.</p>	<p>Some businesses have disaster plans. NODS has copies of approximately 9 plans from private sector companies.</p> <p>Hotels that are members of the Antigua Hotel and Tourism Association have basic disaster plans based on the CTO Hurricane Plan</p>		

Antigua and Barbuda
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society (Communities and their organizations)		<p><i>There is no formal alternative mechanisms to insurance be it contingency credit or contingency equity.</i></p> <p>A few churches and non-formal organizations (“hand”) operate a “loose” form of self-insurance/welfare for their parishioners and partners through systematic savings.¹</p> <p>Some other sectarian groups build up contingency funds for providential purposes.</p> <p><i>NGOs are not involved in housing or property development</i></p>	<p><i>There is no group insurance for homeowners. Homeowners and investors depend entirely on the property insurance market, although some carriers cannot buy adequate reinsurance.</i></p> <p>Most properties in the middle and upper income groups are comprehensively insured to actual value as this forms part of the mortgage agreement.</p> <p><i>Income loss by owners has resulted in about 50% under-insurance of non-encumbered property.</i>²</p> <p>About 50% of properties in the lower income group are insured.³</p> <p>Moreover, apart from vulnerability to hurricanes (given the topography of the island), there are few hazard-prone areas.</p> <p><i>Unlike the motor insurance industry, there is no compulsory insurance for private properties.</i></p> <p><i>Given the islands' vulnerability to hurricanes and volcanic actions, there is need for compulsory insurance for properties.</i></p>			<p><i>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</i></p> <p>Commercial properties, particularly hotels that are part of international chains, may be using risk financing options that allow multi-year coverage that would result in stabilizing premiums.</p>
Local government	Policy	[There is no local government body. All activities are prosecuted by a national agency.]				
	Technical					
Local Disaster Committees						

¹ This non-formal traditional contingency institution still lingers in some rural communities. Many of these institutions have evolved into credit unions.

² Estimates provided by Mr. Robert Josiah, Acting General Manager, State Insurance, Antigua and Barbuda. There is no evidence of provisions for alternatives to insurance. Households are simply assuming the liabilities.

³ Ibid. State Insurance – the major carrier – provides accessible premium rates.

Antigua and Barbuda
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<p><i>Government does not allocate contingency funds in its annual budget based on actuarial probabilities</i></p> <p><i>Fiscal difficulties do not allow for such budgetary allocations. NB: This remains a serious cause for concern given the vulnerability of the islands to natural disasters.</i></p> <p><i>Government will be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p><i>The insurance regulatory function is very inadequate. The office is very poorly staffed, poorly equipped and poorly staffed. Staff lacks expertise in risk management.</i></p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department. However there are no hazard maps governing insurer's levels of catastrophe peril liabilities, no functional linkage between the physical planning and the insurance regulation.</p> <p><i>The insurance regulator needs to:</i></p> <p>(i) <i>have the capacity to do catastrophe premium pricing.</i></p> <p>(ii) <i>educate with respect to reducing the financial impact of events and minimizing the probability of avoidable losses.</i></p>	<p><i>Government has no policy for insuring public assets.</i></p> <p>The public properties, which are insured, are covered under the specific loan conditions and lease arrangements.</p> <p><i>There is no public fund or mechanism established to indemnify the poor or to provide incentive for undertaking mitigation measures.</i></p> <p><i>Government needs to explore the feasibility of:</i></p> <p>(i) <i>Investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</i></p> <p>(ii) <i>Providing incentives for catastrophe risk coverage for low-income groups particularly those occupying areas prone to landslide such as squatters.</i></p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • VC Bird International Airport • Holberton Hospital • The Antigua Recreation Grounds (ARG) • The Free Zone <p>Premiums are paid annually.</p> <p><i>NB: All other public assets are not insured.</i></p>	<p>Government sources external credit for reconstruction and mitigation efforts. Most debt capital is sourced from commercial lenders.</p> <p><i>Additional contingent credit facilities could include:</i></p> <p>(i) <i>World Bank Economic Recovery Facility</i></p> <p>(ii) <i>CDB Disaster Mitigation Facility</i></p>
	Technical					
National Disaster Office		<p>Budgetary allocations are made towards the National Office of Disaster Services (NODS) only for operations. <i>No emergency funds are deployed for contingencies.</i></p> <p><i>NODS depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>NODS promotes risk reduction through the national committees, public education and awareness programs mainly during the hurricane season.</p> <p><i>NODS needs to:</i></p> <p>(i) <i>embark on a broad based insurance, risk management and disaster preparedness education programme</i></p> <p>(ii) <i>emphasize retrofitting, maintenance and building standards and insurance coverage.</i></p>			

Antigua and Barbuda
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
<i>Business and Industry, Financial</i>	<i>Leaders</i>	The National Development Foundation is involved in safer housing training and a revolving loan fund for home retrofit.	Some insurance companies, including State Insurance Company (the major property insurance carrier) and ANJO (United) provide incentives to homeowners, such as lower premium rates for risk reduction, and does some risk assessment and management checks.	<p><i>Public autonomous enterprises under the management of the central government such as Water and Electricity are not adequately insured because of financial difficulties.</i></p> <p>Statutory bodies such as the Port Authority building, Antigua Public Utilities Authority (APUA) and the Social Security Building are insured by State Insurance to their actual value.</p> <p><i>Pooling method would most be appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p><i>Tourism: There is no risk transfer mechanism or self-insurance for locally owned properties.</i></p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower cost through increased portfolio.</i></p>	

Antigua and Barbuda
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>Leadership should be provided by private enterprises that are leaders in financial management particularly the insurance companies - in this case, State Insurance Company.</i></p>	<p>About 100% of company buildings are insured to actual value because the terms and conditions of the debt capital require building standards are strictly adhered to at all stages of the construction.</p> <p>About 100% of company buildings are insured against all perils and are built in accordance with building standards.⁴</p> <p>In most cases, commercial properties are insured to their actual value to meet the conditionalities of the overdraft facilities.</p> <p>Some coverage is taken for business interruption, as the business sector has depended very heavily upon inflows of insurance claim payments for rehabilitation.</p> <p><i>Private firms do not cover compensation for employees.</i></p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p> <p><i>There is need for more forward planning by the private sector.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant's first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mr. Robert Josiah, Acting General Manager, Sate Insurance, Antigua and Barbuda.

⁴ Estimates provided by Mr. Robert Josiah, Managing Director, Sate Insurance, Antigua and Barbuda.

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

BRITISH VIRGIN ISLANDS

British Virgin Islands
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
Local					
<i>Civil Society</i> <i>(Communities and their organizations)</i>	Population groups are aware of local hazards. Community groups have access to hazard maps at the office of the Department of Disaster Management (DDM). <i>Hard copies of hazard maps not yet made available to the public.</i> <i>Hazard risk assessment not done at community level.</i>	Communities are aware of their vulnerabilities. <i>Built development exists in vulnerable coastal and hillside locations.</i>		Public awareness of vulnerability. <i>Uncontrolled grazing by stray animals causes some environmental degradation.</i>	Communities aware of vulnerable groups and facilities.
<i>Local Government</i>					
<i>Local Disaster Committees</i>	10 Zonal Committees throughout the BVI. Had formal training in hazard awareness and findings of 1997 Hazard and Risk Assessment Study. <i>Hard copies of hazard maps not yet made available.</i>	Committees assist DDM to disseminate information to communities.	Committees assist in evaluating adequacy of shelters and ensuring they are well maintained.		Zonal Committees can access digital copies of hazard maps at office of DDM.

British Virgin Islands

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>	<p>National Emergency Advisory Council set up in 1980s, chaired by the Director of Public Works. Includes a Mitigation and Damage Assessment Sub-Committee.</p> <p>Comprehensive Mitigation Planning Framework prepared and submitted to Executive Council for approval in March 2002 after receiving comments from technical agencies.</p>	<p>Government agencies have identified vulnerable groups.</p> <p>Human Vulnerability Assessment on-going in collaboration with social sector agencies.</p>		<p>Some policies exist to protect environment.</p> <p>Private sector marinas assist in protecting mangrove.</p> <p>School projects assist in replanting mangrove.</p> <p><i>Damage to coral reefs and mangrove caused by coastal development and construction known to increase vulnerability of coastal areas to storm surge.</i></p> <p><i>Land reclamation along the coast also causes damage and increases vulnerability.</i></p> <p><i>Erosion caused by hillside development that removes vegetation and increases water runoff. Also lack of drainage infrastructure along hillside roads.</i></p>	<p>Risk maps available for prevalent hazards including storm surge, floods, liquefaction, landslides and high velocity winds.</p>
	<i>Technical</i>	<p>Hazard mapping carried out by foreign consultants but local capacity now exists in BVI to update/review maps.</p> <p>Hazard maps available in digital format and included in GIS database.</p> <p>National GIS network shares hazard mapping information with all government departments.</p>		<p>Development standards revised to reflect impacts observed after Hurricane Hugo.</p>	<p>Increased awareness after Hugo of the impact of environmental degradation on vulnerability, especially due to development and construction and reclamation in coastal areas.</p>	<p>Government agencies maintain inventories of their physical assets.</p> <p>Health Departments maps location of clinics and medical stockpiles using GIS.</p>

British Virgin Islands
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics>.*

		Hazard Assessment and Mapping	Vulnerability Assessment		Risk Assessment	
			Socio-economic	Physical Environmental		
National Disaster Office		DDM advertised availability of Hazard and Risk Assessment Study and availability of maps so interested persons/groups can access it at their office.		<p>1994 Shelter Survey conducted to assess location, capacity, age and structural condition of emergency shelters. Study now being reviewed and unsuitable buildings removed as shelters or relocated if too close to flood prone areas and repaired if necessary.</p> <p>DDM maintains inventory of critical facilities that was recently put on GIS.</p> <p>Location of shelters and telecommunication structures mapped on GIS.</p> <p>Hurricane guides produced with location of shelters and information on hurricane preparedness.</p>	DDM recognizes and aggressively promotes awareness of impact of environmental degradation in coastal areas on vulnerability.	
Business and Industry	Leaders	<p>Members of business community included on disaster related committees.</p> <p><i>Business sector not making use of available hazard information.</i></p> <p><i>Copies of hazard maps not distributed but available in digital format from DDM.</i></p>	<p>Business leaders involved in Zonal Disaster Committees though not specifically targeted.</p> <p>Hotel and Tourism Association represented on Mitigation and other committees.</p>		<p>Mangrove systems protected by private sector marinas and boating community.</p> <p>EIAs used in decision making, usually when requested by public agency.</p>	
	Members			Businesses adopt safer building techniques.		

British Virgin Islands
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
Civil Society (Communities and their organizations)		High level of consciousness among residents of the importance of safe building practices and appropriate techniques. New buildings built with hurricane shutters and straps.	Awareness sessions conducted to sensitize public to preparation of Building regulations. Course run at Community College familiarizes engineering technicians with provisions in Building Regulations. <i>Traditional development patterns resulted in location of development in vulnerable coastal and hillside areas.</i>	BVI Community College recently offering Associate Degree in Disaster Management. Now in second semester. Community College has link with Arkansas Technical University programme in Emergency Administration and Management. BVI signed articulation agreement that allows students to transfer to Arkansas after completing the Associate degree at the Community College. Hazard and vulnerability information incorporated into curriculum of primary and secondary schools. Poverty related vulnerability to be assessed during the ongoing Human Vulnerability Study. Low level of poverty in BVI so this is not seen as a major issue.		Appropriate building materials easily available. Shutters and hurricane straps are exempt from government taxes.
Local Government	Policy					
	Technical					
Local Disaster Committees				Contingency sub-plans for Zonal Committees included in National Contingency Plan.		
National						
Central Planning and Sectoral Agencies	Policy	New public buildings conform to Building Regulations since they were adopted. Regulations bind the Crown. Government encourages use of hurricane shutters and straps.	Building Regulations approved in 1999. Developed under 1995 Building Ordinance. Regulations available for sale at cost of US \$12. Based on OECS Model Building Code and CUBIC. Regulations are used as basis for approvals by the Building Authority. Trained building inspectorate at Building Authority to evaluate structural elements of development applications.	There is a National Disaster Plan that addresses all major hazards and includes recovery measures. Plan now being revised. All key sectors required to have contingency plans. These are prepared with help from DDM and are regularly updated. Copies are lodged with DDM. Tourist Board now preparing a	Private marinas assist in protecting mangroves. School projects assist in replanting mangroves. Marine shelters established and managed by boating community. They provide protected shelters in mangrove where boats can be moored during hurricanes. Largest shelter can accommodate 5-600 yachts. Conservation and Fisheries De-	Post-disaster assessments (e.g. post-Hugo Assessment) include mitigation measures. Government funds made available for recovery and mitigation measures.

British Virgin Islands
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
			<p>Land-Use Plans prepared and approved for Road Town and East End. Hazard information incorporated into Plans which are used as the basis for making land-use decisions.</p> <p><i>Hazard information not well integrated into land-use planning process. Much hazard information not used in making land-use decisions.</i></p> <p><i>National Physical Development Plan prepared but never approved by Executive Council.</i></p>	<p>Tourism Sector Plan involving all major tourism properties.</p> <p>Water and Sewerage Authority conducting study of water and sewerage systems to identify and address deficiencies.</p> <p>Comprehensive Disaster Management Strategy being prepared to coordinate activities of all agencies.</p> <p>National Integrated Development Plan prepared in 1998. One of its main goals was to reduce the country's vulnerability to hazards. Formed basis for BVI's Comprehensive Disaster Management Strategy and Mitigation Plan.</p> <p>Solid Waste Department empties garbage and secures receptacles when hurricane warnings issued.</p> <p><i>Need for more training to make agencies aware of how they can contribute to mitigation measures.</i></p> <p><i>Need to provide agencies with adequate resources to carry out mitigation activities.</i></p> <p><i>Need to get key agencies to work together in a more coordinated manner.</i></p>	<p>Department help keep mangrove areas clean and clear.</p> <p>US Coast Guards assisted with Environmental Sensitivity Mapping between 1998-2000. Maps produced in digital format and Atlas also produced.</p> <p>EIAs requested for major projects.</p> <p>Oil spill Contingency Plan prepared and response team in place.</p> <p>PWD has regular maintenance programme for water courses and ghauts. Includes erection of retaining walls to reducing flooding and removal of debris and garbage.</p> <p><i>No physical Planning or Environmental legislation mandates use of EIAs.</i></p> <p><i>EIAs do not include specific hazard information.</i></p> <p><i>Environmental legislation to protect natural systems is relatively weak.</i></p> <p><i>Need for legislation to allow for imposition of fines for oil spills.</i></p>	

British Virgin Islands
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>	<p>Technical staff in relevant agencies are familiar with and use Building Regulations.</p> <p>Construction of sea defense structures to protect coastline and coastal infrastructure from damage during storm surge.</p> <p>Retrofitting of emergency shelters carried out.</p>	<p>Some training carried out for government departments to promote awareness of Building Regulations.</p> <p>Physical Planning Department coordinates a quarterly Planning Forum for senior government officials and Department Heads to discuss planning issues. These include risk evaluations for development applications and land-use plans and identify necessary planning controls.</p> <p>Early Warning Systems implemented. Monitoring systems in place to track weather before and during hurricanes.</p> <p>National Emergency Broadcast System established to warn public of impending hazard events. System regularly tested.</p> <p><i>Inadequate staff in Development Control Authority and Building Authority to effectively monitor development and enforce Building regulations.</i></p> <p><i>Need for additional training for staff to increase effectiveness of monitoring and enforcement activities.</i></p>	<p>Mitigation Planning Framework addresses a mitigation strategy and administration of the strategy for the public and private sectors.</p> <p>Mitigation Action Plan included use of GIS for hazard information management.</p> <p>Seismic monitoring stations established by Seismic Unit of UWI Trinidad in Tortola and Virgin Gorda following spate of earthquakes in October 2001. Fully operational monitoring system established in Anegada by University of Puerto Rico.</p>	<p>Some environmental protection legislation exists.</p>	<p>Post Hurricane Hugo damage assessment was conducted in 1993. Recommendations helped inform 1997 Hazard Risk Assessment and current Mitigation Strategy.</p> <p>Post-disaster Damage Assessments coordinated by DDM. Physical assessments carried out by Public Works and Physical Planning. Rapid assessments carried out by sectoral agencies.</p> <p>BVI has low level of structural damage to buildings during hurricanes.</p> <p>Government-in-Council established a Disaster Fund with annual allocations of approximately US \$1m to use in the event of a disaster.</p>
<i>National Disaster Office</i>			<p>DDM promotes risk reduction strategies through their Public Information and Education and training and Research Officers.</p> <p>DDM also promotes use of appropriate building materials and identifies where they are available locally.</p>	<p>Core technical expertise available to execute functions.</p> <p>DDM now finalizing Bio-Hazard Plan.</p> <p>DDM has budget head to provide assistance to sectors to prepare and update contingency plans.</p> <p>DDM mandated to conduct annual full-scale national disaster simulation exercise.</p>		<p>DDM coordinates post-disaster damage assessments.</p>

British Virgin Islands
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
<i>Business and Industry</i>	<i>Leadership</i>		Some Insurance Companies assist in promoting hazard awareness campaigns and vulnerability reduction measures.	Tropical Shipping Company sponsored recovery planning workshops organized by DDM for resorts. <i>Need to have private sector recognize their role and become more involved in mitigation.</i>		
	<i>Members</i>	Local businesses manufacture hurricane shutters for use locally and for export to other Caribbean islands.	Appropriate building materials easily available for sale locally. Government offers tax exemptions on hurricane shutters and straps to encourage their widespread use.	Large hotels have disaster plans, including recovery measures, prepared with support from the DDM and Caribbean Tourism Office. Cable and Wireless now run all telephone lines underground throughout the BVI.	Boating community assists in protecting mangrove.	Appropriate building materials easily available.

British Virgin Islands

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

BUDGET SELF INSURANCE

- 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 3-4 years and currently stands at around US \$600-700,000. The absence of major hazard events during the life of the fund has enabled it to accumulate a significant sum.
- Private sector businesses are not required by law to set aside contingency disaster funding. Some major companies do 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.

MARKET INSURANCE AND REINSURANCE

- Government's Insurance Officer estimates that 75-80% of residential and commercial properties are insured and most likely to actual rather than replacement value.
- NAGICO representative notes there are no statistics available, not even from the Supervisor of Insurance, to confirm the percentage of properties that are insured.
- Most people are very conscious of safe building techniques and buildings are strong. Most insure their buildings only if they have a mortgage and insurance coverage is required by the lending institution. Very often, once the mortgage is liquidated, property owners stop insuring the buildings.
- Due to the low incidence of hazard events affecting the BVI people are complacent and are willing to take the risk of not insuring their property
- Most commercial properties are insured since they rely on commercial bank funding and this is a requirement.
- Large number of high value assets owned by BVI residents, eg. yachts. High degree of insurance coverage for high value assts. Government an insurance companies encourage owners to insure.
- There are no programmes offering premium reductions for use of safe building techniques. NAGICO suggests this is because insurance premiums in the BVI—which has been affected by fewer hazard events—are already as much as 50% lower than those in the rest of the north-east Caribbean where the rates are high because of frequent hurricane exposure. Nevertheless, Insurance companies still encourage property owners to reduce their exposure to hazard events by using safe building techniques.
- The Insurance Regulatory office feels they have very little influence over the policies and programmes of Insurance Companies since most are branches with the head offices and parent companies registered outside the BVI

PUBLIC ASSET COVERAGE

- Government buildings (including schools) and vehicles are not usually insured. Some public infrastructure is insured (eg the air and sea ports). Reluctance to insure public buildings and infrastructure is due to the high cost of premiums. Governments estimates it saves money by just meeting its liabilities as they arise.
- There are no known programmes targeting lower income households as the per capita income in the BVI is relatively high and there are few 'low income' households.

RISK POOLING

- There are no known examples of risk pooling

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

DOMINICA

Dominica

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society (Communities and their organizations)			Office of Disaster Management (ODM) organizes community meetings during times of volcanic activity. Relatively little housing and development in hazard prone areas. <i>Some development located in vulnerable areas.</i>	Some vulnerability assessments carried out for hurricanes, especially to assess road network. <i>Need to comprehensive identification of critical facilities in vulnerable areas.</i>		
Local Government	Policy					
	Technical					
Local Disaster Committees		ODM and Ministry of Local Government providing training in risk identification.	In 1998, with threat of volcanic activity in south of island, meetings were held with 12 communities and special training sessions in 4 of these.			
National						
Central Planning and Sectoral Agencies	Policy	Disaster Mitigation Committee set up under World Bank Project. Chaired by PS Ministry of Communication and Works.				
	Technical	Landslide hazard map prepared in early 1980s. <i>Trying to source funds to update.</i> Seismic Research Unit in Trinidad did volcanic hazard map in 1999/2000. Report to be put on website. Physical Planning Division has well developed GIS system which is used to identify areas prone to slippage and other hazards even without detailed hazard maps.	Ministry of Communication & Works identifies structures and facilities vulnerable to hazards.			
National Disaster Office		ODM planned workshops for business sector in May 2002 on Role of Private Sector in Emergency Management. Also scheduled workshop for May 2002 with Dominica Hotel and Tourism Association on Hurricane Preparedness in Tourism Sector.	ODM ensures persons in shelters well cared for during hazard events.			

Dominica

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
<i>Business and Industry</i>	<i>Leaders</i>	Business sector represented on National Emergency Planning Organization. They have the opportunity to express their concerns. <i>Business sector not very active in identifying hazard and risk issues.</i>				
	<i>Members</i>					

Dominica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
Civil Society (Communities and their organizations)			ODM providing training for rural home owners who mostly build wooden buildings.	<i>Hazard information not incorporated into school curricula.</i>	<i>Lack of awareness of environmental issues at the community level.</i>	Building materials available but a little expensive. Some companies may reduce prices after a hazard event.
Local Government	Policy					
	Technical	Councils build some storm drains and roads. Central government funds some maintenance activities.				
Local Disaster Committees		Local Disaster Committees are related to Local Government Structure.		GTZ project prepared model disaster plan. District Disaster Committees to develop Plans based on the model. Pilot project for 2 communities - Bellevue Chopin and Soufriere /Scottshead /Gallion. <i>There are no district disaster plans.</i>		
National						
Central Planning and Sectoral Agencies	Policy	Most public buildings conform to building code. Shelters undergoing retrofitting under World Bank project. <i>Some private buildings may deviate from approved plans.</i>	OECS Building Code customized for Dominica. In use, <i>but not yet adopted by government.</i> Revised Physical Planning legislation before Parliament. Will provide for adoption of Code under new Act. Code and in-house guidelines used to evaluate applications. Land use planners, with assistance from Environment Division provide technical inputs to evaluate suitability of locations, given knowledge of hazard vulnerability. <i>No hazard-specific standards exist.</i> <i>No clear policy guidelines to guide development in south of island, which is vulnerable to earth tremors.</i>	<i>Improper disposal of solid waste increase vulnerability during hazard events.</i> <i>Inadequate sanitation facilities in shelters. No purpose built shelters. Therefore do not have the capacity to deal with waste.</i>	Environmental protection policies developed by Fisheries Division and Environmental Coordinating Unit. EIAs requested for major projects or those in vulnerable areas. EIAs include hazard information. Physical Planning Division brings together relevant agencies to increase awareness of technical staff about environmental issues and to evaluate applications, to help identify mitigation measures to include in development approvals. <i>Environmental systems not well protected.</i> <i>Environmental degradation due to agricultural practices.</i>	After Hurricane David most public buildings were built using hurricane resistant techniques.

Dominica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>	<p>Ministry of Communications and Works built sea walls (eg between Rouseau and Cane field and in Portsmouth.)</p> <p>Technical staff in relevant agencies have copies of building code.</p> <p><i>Technical staff need to be more familiar with Code.</i></p>	<p>Agencies adhere strictly to Code.</p> <p>Physical Planning Division organizes workshops for staff with input from relevant agencies to sensitize them to environmental and hazard issues.</p> <p>Physical Planning organizes training for their staff and staff of other relevant agencies to familiarize them with technical and legal aspects of building code.</p> <p>Workshops held with builders years ago to increase awareness of safe techniques and mitigation measures. Additional training will be conducted once the code is approved.</p> <p>Private firms, with National Development Foundation, hold workshops for all stakeholders in safe building practices. Annual workshops held by Credit Unions for prospective home owners.</p> <p><i>National building code not formally adopted by Government.</i></p> <p><i>Physical Planning staff not well trained in hazard issues. Also inadequate numbers of staff to do inspections.</i></p> <p><i>Post of Chief Building Inspector at Physical Planning has been vacant for past 5 years.</i></p> <p><i>Physical Planning staff not familiar with legal aspects of Code.</i></p> <p><i>Standards not consistent between agencies—Physical Planning and Environmental Health for instance. Need to improve consistency and standardize development standards.</i></p>			

Dominica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
<i>National Disaster Office</i>		Under World Bank Project, Office of Disaster Management building 21 storm drains in 21 communities and targeting another 21 with local help.	<p>National Emergency Management Act is before Parliament. National Consultation scheduled in March before 2nd reading.</p> <p>USAID and OAS funded preparation of information leaflet to guide retrofitting of small buildings. Also used in community training with rural home owners.</p> <p>ODM uses media campaigns to promote use of mitigation measures.</p>	<p>Evacuation plan in place for volcanic eruption.</p> <p><i>ODM not well staffed.</i></p>		Community vulnerability assessment and evacuation plan prepared in response to landslide and landslide dam in Layou River.
<i>Business and Industry</i>	<i>Leadership</i>		Banks impose loan ceiling for lending in south of island, which is known to be vulnerable to earth tremors. Insurance companies also reluctant to insure properties in these areas. These policies/practices serve as a disincentive to people from building in this vulnerable area.	ODM targets Hotel and Tourism Association to cover all members.		
	<i>Members</i>			Some hotels have prepared simple Disaster Plans. ODM helping them to improve plans.		<i>Businesses have no recovery plans.</i>

Dominica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
<i>Civil Society (Communities and their organizations)</i>		<p><i>There is no formal alternative mechanisms to insurance be it contingency credit or contingency equity.</i></p> <p>Some churches and non-formal organizations (“Sou Sou”) operate a “loose” form of self-insurance/welfare for their parishioners and partners through systematic savings.⁵</p> <p>Some other sectarian groups and credit unions build up contingency funds for providential purposes.</p> <p><i>NGOs are not involved in housing or property development.</i></p>	<p><i>There is no group insurance for homeowners. Homeowners and investors depend entirely on the property insurance market, although some carriers cannot buy adequate reinsurance.</i></p> <p>Most properties in the middle and upper income groups are comprehensively property insurance to actual value as this forms part of the mortgage agreement.</p> <p><i>Income loss due to the persistent decline in the banana industry (the major employer in the economy) since 1995 has resulted in a significant level of under-insurance of non-encumbered property.</i></p> <p><i>A large percentage of the housing stock in the lower income group is not insured. And there is no self-insurance even if many households assume the liabilities.</i></p> <p><i>Moreover, in addition to the vulnerability to hurricanes, there are many hazard-prone areas.</i></p> <p><i>Unlike the motor insurance industry, there is no compulsory insurance for private properties.</i></p> <p><i>Given the island’s vulnerability to volcanic actions, and its frequent devastation by hurricanes, there is dire need for affordable compulsory insurance for properties.</i></p>			<p><i>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</i></p> <p><i>Commercial properties do not use risk-financing options that allow multi-year coverage that would result in stabilizing premiums.</i></p> <p>NB: Most hotels are locally owned and operated.</p>
<i>Local government</i>	<i>Policy</i>	There are Local government bodies in all villages, towns and the City but all activities are co-ordinated by a national agency.				
	<i>Technical</i>					

⁵ This non-formal traditional contingency institution still lingers in some rural communities. Many of these institutions have evolved into credit unions.

Dominica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
<i>Local Disaster Committees</i>						
National						
Central Planning and Sectoral Agencies	Policy	<p>Government does not allocate contingency funds in its annual budget based on actuarial probabilities.</p> <p><i>Serious fiscal difficulties do not allow for such budgetary allocations. NB: This remains a serious cause for concern given the vulnerability of the islands to natural disasters particularly windstorms and volcanic actions.</i></p> <p>Government will be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</p>	<p>The insurance regulatory function is inadequate. The office is poorly staffed and poorly equipped. Staff lacks expertise in risk management.</p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department. However there are no hazard maps governing insurer's levels of catastrophe peril liabilities and no functional linkage between the physical planning and the insurance regulation.</p> <p>The insurance regulator needs to:</p> <p>(i) Have the capacity to do catastrophe premium pricing.</p> <p>(ii) Educate with respect to reducing the financial impact of events and minimizing the probability of avoidable losses.</p>	<p>Government has no policy for insuring public assets.</p> <p>The public properties, which are insured, are covered under the specific loan conditions and lease arrangement.</p> <p><i>There is no public fund or mechanism established to indemnify the poor or to provide incentives for undertaking mitigation measures.</i></p> <p>Government needs to explore the feasibility of</p> <p>(i) Investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</p> <p>(ii) Providing incentives for catastrophe risk coverage for low-income groups particularly those occupying areas prone to landslide such as squatters.</p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • Government headquarters • Treasury Building • Post Office <p>NB: All other public assets are not insured.</p>	<p>Government sources external credit for reconstruction and mitigation efforts. Most debt capital is sourced from commercial lenders.</p> <p><i>Additional contingent credit facilities could include:</i></p> <p>(i) World Bank Economic Recovery Facility</p> <p>(ii) CDB Disaster Mitigation Facility</p>
	Technical					

Dominica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
<i>National Disaster Office</i>		<p><i>Budgetary allocations are made towards the Disaster Preparedness Office (DPO) only for operations. No emergency funds are deployed for contingencies because of fiscal difficulties.</i></p> <p>However government has EC\$853,000 in a Fiscal Tranche at the Central Bank which is a contingency fund.⁶</p> <p><i>DPO depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>(i) DPO promotes risk reduction through the national committees, public education and awareness programs mainly all year round but is particularly active during the hurricane season.</p> <p>(ii) Although its Focal Points are very active, <i>its activity is restricted because of limited funds.</i></p> <p><i>DPO needs to:</i></p> <p>(i) <i>embark on a broad based insurance, risk management and disaster preparedness education programme</i></p> <p>(ii) <i>emphasize retrofitting, maintenance and building standards and insurance coverage</i></p>			
<i>Business and Industry, Financial</i>	<i>Leaders</i>	<p>There is no society-wide Advisory Council, but the focal points in the village, towns and city councils are very active in the awareness and education programmes with respect to disaster preparedness, disaster mitigation and risk transfer.</p> <p>The National Development Foundation has organized safer housing promotions and loan funding for retrofit.</p> <p><i>The work of DPO must be further broadened to include a Technical Advisory Team to influence policy at the Cabinet Sub-Committee level. The members should be drawn from NGOs, banking, insurance, industry and engineering to advise the Insurance Regulator and to promote best practices.</i></p>	<p>Some insurance companies provide incentives to homeowners such as lower premium rates for risk reduction and undertake some risk assessment and management checks. <i>However, the high deductible for catastrophe coverage makes the premium prohibitive for some households.</i></p>	<p><i>Public autonomous enterprises under the management of the central government such as Water and Electricity are not adequately insured because of financial constraints.</i></p> <p>Statutory bodies such as the Social Security Building are insured to their actual value.</p> <p><i>Pooling method would most be appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p>Banana Industry: The Windward Island Crop Insurance (WINCROP) provides a measure of protection for wind storm damage, <i>but there is no risk transfer mechanism or self-insurance. There is very little reserving because the industry is experiencing financial difficulties.</i></p> <p>Tourism: <i>There is no risk transfer mechanism or self-insurance for locally owned properties.</i></p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower costs through increased portfolio.</i></p>	<p><i>Alternative risk financing for the business and industry would involve:</i></p> <p>(i) <i>Allocation of capital reserve during the profitable years to be used as collateral for debt financing for reconstruction effort.</i></p> <p>(ii) <i>Use of capital market instruments to generate raise equity capital for the recovery effort</i></p> <p>(iii) <i>Creation of a venture capital fund to supplement recoveries for business interruption insurance.</i></p>

⁶ ECCB Credit Market Report, Feb 15, 2002

Dominica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget, Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>Given the small size of the insurance sector, influential private sector firms will have to provide leadership. The larger players in the economy such as Roseau Credit Union would have to assume an active role.</i></p>	<p>Almost all company buildings are insured to actual value because the terms and conditions of the debt capital require building standards are strictly adhered to at all stages of the construction.</p> <p>Almost all company buildings are insured against all perils and are built in accordance with building standards.</p> <p>In most cases, commercial properties are insured to their actual value to meet the conditionalities of the overdraft facilities.</p> <p>Some companies purchase coverage for business interruption, but the business sector has depended very heavily upon inflows on insurance claims payments for rehabilitation.</p> <p><i>Private firms do not cover compensation for employees.</i></p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p> <p><i>There is need for more forward planning by the private sector.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant's first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mr. Nicholas Bruno, Acting Budget Director, Ministry of Finance, Roseau.

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

DOMINICAN REPUBLIC

Dominican Republic
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment		Risk Assessment	
		Socio-economic	Physical Environmental		
Local					
Civil Society (Communities and their organizations)	<p>The Dominican Disaster Mitigation Association (ADMD), has worked since 1995 with over 50 NGOs and community groups in over 700 communities to assist them in identifying and mapping vulnerabilities and local hazards.</p> <p>The Peace Corps and NGOs⁷ have sponsored community disaster preparedness training in at least 200 high-risk communities, mostly in collaboration with the ADMD.</p> <p>After Hurricane Georges, the Civil Defense and Red Cross implemented awareness campaigns, giving over 2,000 presentations to more than 50,000 Dominicans nationwide.⁸</p> <p><i>Many of the community-based efforts are short-term pilot projects, which do not provide long term follow-up necessary for lasting impact on vulnerability reduction.</i></p>	<p>Most population groups are aware of at least part of their vulnerabilities and consider that poverty and other socio-economic problems are more important than flooding, contamination and other hazards.</p> <p>During Hurricane season it is common for supermarkets, the telephone company, CODE-TEL/VERIZON, and the newspapers to distribute orientation information. The press only runs seismic hazard information when a major earthquake happens abroad or if a tremor is felt in the country. However, the ADMD and Sociedad Dominicana de Sismología e Ingeniería Sísmica (SODOSIS-MICA) regularly circulate information to hundreds of international and national organizations.</p>	<p><i>No comprehensive inventory of important structures exists.</i></p> <p>At the local level, vulnerability assessments have been conducted in selected communities. In Santiago, for instance, a number of critical facilities in Santiago have been identified as hazardous structures requiring a inspection and corrective/ mitigative measures to assure their future functional capacity.⁹</p> <p><i>Given that an estimated 80% of construction is informal, a significant percentage of this takes place in high-risk areas without interference on behalf of the authorities due to lack of political commitment. Nor are the communities well-organized enough to prevent further settlement in hazard-prone areas.</i></p>	<p>The training of local groups to identify and protect environmental systems that stabilize potential hazards or buffer hazard effects is included in the proposed Natural Resources and Environmental legislation to be submitted to Congress in early 2002.</p>	<p>In general, the government, private and voluntary organizations understand that settlements and facilities in flood prone areas and industrial areas are highly vulnerable, <i>however lack of resources and/or political commitment impedes the development and implementation of an action plan.</i></p> <p>Subsequent to hurricane Georges, comprehensive vulnerability reduction initiatives were undertaken in Haina, the country's most important port and industrial area, and in Tamayo, Vicente Noble and Jaquimeyes, an area devastated by flooding,¹⁰ and assistance was provided to 81 communities in the development of community emergency plans and committees.¹¹</p>

⁷ Including World Vision, Food for the Hungry, Mujeres en Desarrollo (MUDE), Centro de Educación de la Mujer (CE-MUJER), Centro de Apoyo a la Micro, Pequeña y Mediana Empresa (CAMPE-INTEC), Esperanza International, Asociación Dominicana de Ayuda Social, Ecológica y Cultural, Inc. (ADESAEC), and Plan International.

⁸ With financial assistance from the European Community Humanitarian Office (ECHO), ETRENA/ABT/Technical Secretariat to the Presidency (STP)/Inter-American Development Bank (IADB) and other sources.

⁹ Including the Cabral & Baez University Hospital; the Santiago Fire Station; and the Taveras/Bao Dam system.

¹⁰ Implemented by ADMD, with funding from the USAID reconstruction program after Hurricane Georges. Based on the US Federal Emergency Management Agency (FEMA) Project Impact model.

¹¹ Communities in the southern portion of the country. Assistance from the International Resource Group (IRG).

Dominican Republic

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
<i>Local Government</i>	<i>Policy</i>		The Civil Defense has identified, evaluated and marked a small number of buildings as shelters in the event of a hurricane or earthquake, and during hurricane season published information in the press about the location of the shelters.	Formal physical development (approx 20%) requires a construction permit from Public Works, a land use permit from the Municipal authorities and completion of several related processes, including increasing environmental controls, which often do not reflect awareness of natural or other hazards. <i>Most development (estimated at 80%) not subject to formal development controls.</i> <i>Environmental controls often do not reflect awareness of natural or other hazards.</i>		<i>Risk maps are not available at a scale useful for local government.</i>
	<i>Technical</i>	Flood levels, soil conditions, erosion and slope failure, and structural weaknesses in housing detailed in three high-risk communities in Santo Domingo: La Zurza, El Capotillo and Simón Bolívar. ¹² To the extent that the community can see and/or is aware of the presence of a specific structure (lifeline or otherwise) communities can locate and identify the local hazard. Information on problems with critical facilities not readily available from the responsible authorities. <i>Hazard maps not available for most communities. Critical facility information is not available in any formal or comprehensive format.</i>	International development agencies and organizations have compiled damage-related information and are active promoters of safer construction techniques in the Dominican Republic. ¹³ <i>Vulnerability information not available for most of the country. Where available, it has typically been collected as part of an externally funded project.</i> <i>A system should be put in place for diagnostic studies of damage from natural hazards.</i>	Selected NGOs and community groups include mitigation measures in repaired and newly built homes. ¹⁴ <i>Physical vulnerability information not available for the great majority of structures.</i> <i>Studies of hazard-related damages are not typically conducted. A system should be put in place for diagnostic studies of damage from natural hazards</i>		Both risk and hazard maps were developed for La Zurza, El Capotillo and Simón Bolívar in Santo Domingo.

¹² Funded by USAID and implemented by the International Resources Group (IRG) and Instituto Dominicano de Desarrollo Integral (IDDI).

¹³ Including the Federal Emergency Management Agency (FEMA), the Housing and Urban Development Department (HUD), the National Institute of Standards and Technology (NIST), the United States Agency for International Development (USAID) and the Cooperative Housing Foundation (CHF).

¹⁴ Communities participating in the USAID sponsored Post-Hurricane Georges reconstruction project guided by CHF.

Dominican Republic
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
Local Disaster Committees	Existing and active local disaster committees have only the hazard maps they prepared for use and reference. <i>Generally the digital maps remain in offices such as the Military Cartographic Institute and the Ministry of Mines and are not in a scale as to be useful to specific communities.</i> Maps of storm-related hazards ¹⁵ made available to hotel, free zone and other industrial and private organizations.	Organized and active local disaster committees have identified the highest risk areas, which have been included in their evacuation plans. Special attention is paid in these plans to children, the elderly and disabled.	<i>Development projects often not designed to accommodate extra, hazard-related forces.¹⁶</i>		

¹⁵ Developed under the USAID/OAS Caribbean Disaster Mitigation Project (CDMP).

¹⁶ Example: Flood containment wall in Tamayo, which was designed to control normal water levels, not hurricane-related levels.

Dominican Republic

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
Central Planning and Sectoral Agencies	<i>Policy</i>	<p>The Civil Defense has a proposed legislative package in Congress on Disaster Prevention and Mitigation, which establishes and structures a National Disaster Mitigation program.</p> <p><i>Significant new private and public sector buildings should be required to install meteorological and seismic instruments, to be maintained by educational institutions.</i></p>	<p>In general, the government, private and voluntary organizations understand that settlements and facilities in flood prone areas and industrial areas are highly vulnerable, however <i>lack of resources and/or political commitment impedes the development and implementation of an action plan.</i></p>	<p>Assessments for project appraisals focus on industrial, environmental, economic and political concerns. <i>Natural hazards are generally not considered.</i></p>	<p>Natural Resources and the Environment Legislation currently in process. Under this legislation, national development policies and plans will be established to protect natural systems that contribute to hazard stabilization or mitigation.</p>	
	<i>Technical</i>	<p>Digital orthophotography integrated into the National Planning Office, the Mining Ministry and other related government dependencies with resulting information available at scales of 1: 250,000; 1:50,000, and 1:5,000.¹⁷</p> <p><i>Adequate maps of rain hazards exist. Maps of wind hazards available but requires further attention and available seismic hazard maps are inadequate. The integration of hazard information into a national GIS database has barely begun.</i></p> <p><i>National hazard maps, showing critical facilities, should be published in national newspapers at regular intervals.</i></p> <p><i>Networks of measuring stations for rainfall, wind speed, barometric pressure and seismic strong motions should be established and maintained.</i></p>	<p>The Civil Defense has a proposed legislative package in Congress on Disaster Prevention and Mitigation, which establishes and promotes hazard vulnerability self-assessment techniques and prioritizes vulnerability reduction measures, based on socio-economic impact and environmental priorities.</p>	<p><i>The existing official wind and seismic codes for construction provide inadequate standards for structures to withstand prevalent natural hazards and are currently being upgraded to improve performance.</i></p> <p><i>Mechanisms for regular update and maintenance of the building standards and codes needs to be developed.</i></p> <p>Enforced compliance with the building standards has been proposed and approved¹⁸ <i>but has yet to be assigned an operating budget by the President.</i></p> <p>Most government agencies maintain some type of documentation regarding the physical assets in inventory.</p> <p>Standards currently exist for building materials, <i>but they require updating and better enforcement.</i></p>	<p>The Ministry of the Environment and the National Institute of Hydrological Resources monitor environmental degradation.</p>	<p><i>Critical facility information is not available in any formal or comprehensive format.</i></p> <p><i>As-built drawings and specifications should be placed in public archives. This should be a requirement for the issuing of occupancy certificates, including for Government facilities.</i></p>

¹⁷ Developed under the IADB funded Post-Hurricane Georges program.

¹⁸ National Office for the Seismic Evaluation of Buildings and Infrastructure (ONESVIE).

Dominican Republic
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment		Risk Assessment	
			Socio-economic	Physical		Environmental
National Disaster Office		The National Disaster Office has proposed a legislative package to promote the use of hazard information for development and investment decisions across all sectors of government and the economy.	The Civil Defense has identified highly vulnerable population groups and is seeking government resources to implement plans to reduce vulnerability in these groups.	The Civil Defense has solicited resources to inventory and conduct a vulnerability audit of all critical facilities.	The Ministry of Education and the National Institute of Hydrological Resources conduct courses for primary school students regarding the importance of safe water.	
Business and Industry	Leaders	<p>Since 1998/99 leaders of each sector in Santiago have developed jointly a Strategic Development Plan for the City of Santiago de los Caballeros to identify and prioritize strategic growth, service and other measures, taking into consideration active traces of the Septentrional Fault, areas prone to landslides, and flooding.</p> <p>The businesses, industries and local government in Haina agreed upon, authorized and marked a hazardous materials safety route.</p> <p>Many large companies, corporations, franchises and chains use hazard maps in compliance with international safety guidelines such as ISO9000 and ISO14000.</p> <p>The Oil Refinery, REFIDOMSA, has supported the development, distribution and use of hazard maps.</p>	Leaders such as CODETEL and the National Insurance Company support national activities, including provision of support to the Civil Defense.	<p>Generally corporations, franchises, chains and companies with international contracts are required to comply with international design and building as well as safety and environmental standards in keeping with programs such as ISO9000 and ISO14000.</p> <p>CODETEL¹⁹ assesses suitability of new project sites, considering soil conditions and other risk factors.</p> <p>The oil refinery, REFIDOMSA, is a leader in industrial safety and advised the Dominican Authorities (Marines) in development of Contingency Plans.</p> <p><i>Due to lack of awareness of the local seismic code, some engineers and companies modify and apply American, Japanese, and other seismic resistant building codes.</i></p>	<p>Under Law 6400, the Ministry of the Environment requires projects to comply with specific standards to obtain a building permit and an operating license. <i>However, there is little enforcement and generally this is not done.</i></p> <p>All hotels and industries are required to monitor environmental degradation.</p>	

¹⁹ GTE/Verizon affiliate in the Dominican Republic.

Dominican Republic
Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
	<i>Members</i>	<p>Large employers are usually required by their headquarters to conduct regular structural assessments of facilities and implement suggested corrective and/or preventive measures.</p> <p>The oil refinery, REFIDOMSA, regularly uses hazard maps in decision making to prevent oil spills and other incidents.</p> <p>Technical groups such as SODOSISMICA, GE2 and others provide structural assessments of facilities.</p>		Both REFIDOMSA and CODETEL conduct regular vulnerability audits of their facilities and support networks, the former as a requirement by SHELL, the latter as a requirement for the insurance policy.		

References

The information generated is the product of:

- 1 The consultant's (Christine M. Herridge) first hand knowledge of the NGOs, Civil Defense and Private Sector vulnerability identification and reduction activities as Coordinator of the Asociación Dominicana de Mitigación de Desastres (ADMD) in the Dominican Republic.
- 2 Discussions with key sources of information regarding insurance, the environment, the building code, Public Works, the National Planning Office, hotels, free zones, and the IADB programming including:
 - Ing. Simón Mahfoud, Technical Vice President, Compañía Nacional de Seguros
 - Ing. Evelio Martínez, 2nd Vice-President of Engineering, Compañía Nacional de Seguros (SEGNA)
 - Ing. Máximo Viñas, General Advisor in Health, Industrial Safety and the Environment, REFIDOMSA (the Dominican Oil Refinery, affiliate of SHELL)
 - Ing. Américo Julio Peña, Environmental Advisor to the Senate of the Dominican Republic
 - Ing. Héctor O'Reilly, President of SODOSISMICA, Technical Advisor to Public Works
 - Mr. Ivan Reynoso, Executive Director of the Santiago Chamber of Commerce and Production
 - Mr. José Almonte, Director of Industrial Safety and Quality, CODETEL/VERIZON
 - Mrs. Paula Dimitri, Executive Director of the Santo Domingo Hotel Association
 - Ing. José Alarcón, Coordinator of the Risk Management and Zoning Component of the Technical Secretariat to the Presidency's Disaster Prevention Sub-Program
 - Mrs. María Rodríguez, Head of the Environmental Planning Department of the National Planning Office

Dominican Republic
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
Civil Society <i>(Communities and their organizations)</i>		<p>Consejo Inter-Institucional para la Coordinación de Programas de Viviendas (CII-VIVIENDAS) has developed and distributes a series of "Self-built construction guides."</p> <p><i>Mitigation measures designed to address one hazard (e.g. flooding) rarely address the full range of hazards (e.g. flooding and hurricane impacts).</i></p> <p>Community residents that have participated in the Cooperative Housing Foundation's (CHF) supervised housing repair and construction programs are able to share safer techniques with neighbors.</p> <p><i>Demonstration homes should be constructed in communities illustrating good practices for small domestic houses (appr 70 m²)</i></p>	<p><i>There is no control over informal housing in hazard prone areas, which is often quite dense.</i></p> <p>Communities often question the standards of new construction and refurbishment projects, <i>but often with little effect.</i></p>	<p>The Ministry of Education has developed texts for various subjects to include hazard and vulnerability reduction information in the school curricula.</p> <p>NGOs²⁰ address the relationship between poverty and vulnerability in development projects.</p>	<p>Significant strides have been taken towards the development and implementation of mechanisms and knowledge to identify environmental degradation.</p>	<p>Appropriate building materials are generally available, <i>but often without proper installation instructions.</i></p> <p>Recent post-disaster reconstruction projects have required implementation of mitigation measures with appropriate methods and materials.²¹</p> <p><i>No general standards or controls are in place for post-disaster measures.</i></p>
Local Government	Policy	<p><i>Much of the public infrastructure is currently located within hazardous areas.</i></p>	<p>A building code exists, <i>however, it is only available as a series of separate provisions, lacks references to crucial auxiliary documents (such as the wind and seismic codes) and remains largely unenforced. Few training courses exist and public information is deficient.</i></p> <p><i>A system of effective enforcement of standards needs to be designed and enforced.</i></p>			<p><i>There are no local recovery plans in place.</i></p> <p><i>All building and facility failures should be studied for causes. Failure reports should be a mandatory part of the approvals process where reconstruction or major repairs are planned.</i></p>
	Technical		<p>Flood level markers were recently installed along the Yaque del Sur River as part of an early warning system for the communities of Tamayo, Vicente Noble and Jaquim-eyes.</p>			

²⁰ For example, World Vision, Food for the Hungry, Plan International and the Instituto Dominicano de Desarrollo Integral (IDDI).

²¹ For example, post-hurricane Georges housing reconstruction and rehabilitation implemented by the Cooperative Housing Foundation, with funding from USAID.

Dominican Republic
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
<i>Local Disaster Committees</i>			<p>Over 700 communities (a minority nationwide) have received assistance with the establishment of community emergency committees; received training in community disaster preparedness, first aid, evacuation routes and security brigades; and received a donation of tools and emergency equipment.</p> <p><i>The majority of high-risk communities still have not received orientation, assistance or equipment.</i></p>	<p>Many local committees include representatives of environmental groups.</p> <p>Through their members, the ADMD-sponsored disaster committees have formed links with local authorities, reported key statistical community-based information and have met with Civil Defense, Red Cross and other Provincial authorities.</p>	

Dominican Republic
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p>All new public buildings are to conform to existing standards. The appropriateness of the standards is not generally satisfactory.</p> <p><i>Only an estimated 30% of new buildings obtain the construction permit and an estimated 99% begin construction before the designs are approved by Public Works.</i></p> <p><i>All public buildings should be subject to an independent review, including those designed by engineers and architects.</i></p>	<p>The building code is the basis for development approval <i>however there is little enforcement</i>. Currently both the wind and seismic codes are being upgraded.²²</p> <p>The National Planning Office recently received a set of maps²³ to assist with land use plans, <i>however little information is available regarding soil composition.</i></p> <p>A trained building inspectorate has been proposed and the approval was signed by the President in 2001, creating the National Office of Seismic Evaluation for Buildings and Infrastructure. <i>This office has not yet been presented or assigned a budget.</i></p> <p>The designs of important facilities are reviewed but <i>there is no control over the building process unless the proprietor or financier contracts this service.</i></p> <p><i>The mechanism for checking must be changed.</i></p> <p>Standards have been developed for about half of the standard building materials. <i>There is, however, little control of quality standards for building materials.</i></p>	<p><i>Many significant deficiencies exist in the energy, transportation, health, education, water and other key sectors,²⁴ most of which are government dependencies subject to the lack of resources and political commitment to achieve improvements.</i></p>	<p>The Ministry of the Environment has environmental management and protection policies and programs which include protection for natural systems that stabilize hazardous areas. <i>Many remain unenforced due to lack of political commitment.</i></p> <p><i>Environmental impact assessments do not include natural hazard considerations.</i></p> <p><i>Agriculture and forestry practices often degrade protective natural systems due to obsolete techniques and lack of enforcement of controls by the authorities, such as Law 123 (extraction of aggregate materials from river beds.)</i></p>	<p><i>Few recovery plans have been developed.</i></p> <p><i>Financing for immediate recovery is channeled through the Technical Secretariat to the Presidency but has not developed the capacity to provide a Damage Assessment and Needs Analysis for each government dependency.</i></p>

²² Financed by the World Bank and IADB.

²³ Financed by the IADB.

²⁴ For example, the current drainage infrastructure is only serves approximately 13% of the capital city of Santo Domingo.

Dominican Republic
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	Technical	Technical staff in most agencies is generally familiar with and use the existing building code.	<i>Public Works does not have adequate human, financial or material resources to develop or enforce development standards. The Ministry of the Environment does have the resources but is recently established and not yet able to fulfill its charter due to lack of political commitment.</i> <i>Technical staff should be employed on the basis (in part) on successful completion of formal exams related to their specific functions. Regular re-certification should be required.</i>			
National Disaster Office			The Civil Defense proposes to play a key role in the authorization of all construction <i>but does not have the resources or authority to do so.</i>	<i>The political leaders have not been integrated into the system and the public believes that little has been done.</i> <i>The Civil Defense does not have resources to hire technical experts and must rely on donations of technical assistance.</i>		Standards for post-disaster rehabilitation and new construction reviewed, at times, for adequacy. <i>Rehabilitation efforts are donor driven according to imposed criterion often ignoring communities' development priorities. Communities and organizations should receive guidance in structuring external assistance to include mitigation.</i>

Dominican Republic
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Business and Industry	Leadership	<p>Businesses conduct training in safety and other topics with the understanding that the employees will practice safety techniques at home and in the community.</p> <p>Businesses such as the Reserve Bank, CODETEL, and others have sponsored presentations on the DR's natural hazards and disaster mitigation nationwide for their employees, in addition to distributing printed materials and providing training in fire prevention and control.</p>	<p>Generally corporations, chains and franchises implement international safety and other standards to reduce the vulnerability of non-structural elements.</p> <p>The ADMD continues to emphasize the importance of a fire prevention, detection and control capacity along with other preventative measures.</p>	<p>Generally corporations, chains and franchises have a contingency plan and brigades made up of employees representing the various shifts and departments, however this is done internally, not in collaboration with national or local plans. CODETEL and REFIDOMSA collaborate with the Civil Defense and related authorities due to the importance of their services to the country.</p>	<p>The proposed legislation on Natural Resources and the Environment will require leaders and organizations to adopt and promote the use of international standards that reduce the potential impact of disasters and accidents on the environment. Many corporations, chains and franchises already comply with international guidelines such as ISO9000 and ISO14000.</p>	
	Members	<p>Technical organizations such as SODOSISMICA, GE2 and Dominican Union for Engineers and Architects (CODIA) can be consulted for structural retrofit and other services, technical assistance.</p> <p>Generally corporations, chains and franchises require the use of specific standards by designers and contractors, and conduct regular inspections and require retrofitting and modifications to comply with company-wide standards.</p> <p>Appropriate building materials are available.</p>	<p>Appropriate building materials are available for sale.</p> <p>Information on non-structural mitigation measures is available.</p> <p>Approximately 50% of companies will consult their insurer regarding design specifications to include fire prevention measures and other elements before construction to reduce insurance premiums for fire coverage.</p>	<p>Business and Industry Association and its members developed an Emergency Plan for the Haina area, in coordination with local authorities and includes the Emergency Plan prepared by the local community emergency committees.</p> <p>Both REFIDOMSA and CODETEL report having tested disaster plans developed based on local hazard information, which include preparation recommendations for employees' homes and families.</p> <p>REFIDOMSA is assisting the Dominican Marine Corps with the development of its disaster plan and assisted with dissemination of information on controls for toxic and hazardous material spills and contamination.</p>	<p>The Ministry of the Environment provides limited training regarding reduction of environmental impacts. In addition, universities offer Environment masters programs.²⁵</p> <p>INTEC has a <i>limited</i> program to promote training and research to reduce environmental impact.</p>	<p>Just-in-time setup and availability of shipping containers has more impact on inventory levels than considerations related to hurricane season. REFIDOMSA, CODETEL, and Hotels, however do adjust inventory in preparation for hurricane season.</p> <p>Most corporations, chains and franchises strive to reduce downtime to a minimum through the design and implementation of contingency plans.</p> <p>Often, corporations, chains and franchises will import appropriate building materials and technicians from headquarters, if not available locally.</p>

²⁵ Including the Universidad Nacional Pedro Henríquez Ureña (UNPHU), Universidad Autónoma de Santo Domingo (UASD) and Instituto Nacional de Tecnología (INTEC).

Dominican Republic

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

References

The information generated is the product of:

- 3 The consultant's (Christine M. Herridge) first hand knowledge of the NGOs, Civil Defense and Private Sector vulnerability identification and reduction activities as Coordinator of the Asociación Dominicana de Mitigación de Desastres (ADMD) in the Dominican Republic.
- 4 Discussions with key sources of information regarding insurance, the environment, the building code, Public Works, the National Planning Office, hotels, free zones, and the IADB programming including:
 - Ing. Simón Mahfoud, Technical Vice President, Compañía Nacional de Seguros
 - Ing. Evelio Martínez, 2nd Vice-President of Engineering, Compañía Nacional de Seguros (SEGNA)
 - Ing. Máximo Viñas, General Advisor in Health, Industrial Safety and the Environment, REFIDOMSA (the Dominican Oil Refinery, affiliate of SHELL)
 - Ing. Américo Julio Peña, Environmental Advisor to the Senate of the Dominican Republic
 - Ing. Héctor O'Reilly, President of SODOSISMICA, Technical Advisor to Public Works
 - Mr. Ivan Reynoso, Executive Director of the Santiago Chamber of Commerce and Production
 - Mr. José Almonte, Director of Industrial Safety and Quality, CODETEL/VERIZON
 - Mrs. Paula Dimitri, Executive Director of the Santo Domingo Hotel Association
 - Ing. José Alarcón, Coordinator of the Risk Management and Zoning Component of the Technical Secretariat to the Presidency's Disaster Prevention Sub-Program
 - Mrs. María Rodríguez, Head of the Environmental Planning Department of the National Planning Office

Dominican Republic
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
<i>Civil Society (Communities and their organizations)</i>		Many church and community organizations with international headquarters channel resources to local chapters in response to damage reports and requests made by local offices.	<i>Few residential and commercial properties are insured, and those that are insured are frequently not insured to actual value, to save on premiums. Often the level of insurance is related to the outstanding loan principal. Generally loan recipients are required to pay an additional fee to cover life insurance, however a policy to cover damage from hurricanes or earthquakes is not required or promoted. There should be public education programs about insurance.</i>			
<i>Local government</i>	<i>Policy</i>					
	<i>Technical</i>					
<i>Local Disaster Committees</i>						

Dominican Republic
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<p><i>The Government does not allocate contingent disaster funding in its annual budget, but there is a bill before Congress that would enable this practice.</i></p> <p><i>The Government does not offer tax incentives to finance the creation of private catastrophe reserves. Government should exempt from taxable income such certifiable reserves for future damaging events.</i></p> <p><i>The Government often has difficulty complying with the counterpart requirements to gain access to loans offered by the IADB and World Bank.</i></p>	<p>The insurance regulatory function is adequately empowered and funded, with trained staff for controlling insurers' fiscal health and catastrophe peril liabilities.</p> <p><i>The insurance regulator does not oversee the implementation of hazard maps governing insurers' levels of catastrophe peril liabilities, but reinsurers do use hazard maps in this way.</i></p> <p>5% of after-tax earnings is contributed to a Catastrophe Loss Trust Fund.</p> <p>The insurers are currently classified by size and premiums collected/sales volume. Work underway with M Best Co to prepare new rating system.</p>	<p>The insurers and the IADB are promoting insurance for public properties, which is still not required. There is a legislative proposal in the House of Representatives which would require that 0.5% of the National Budget be reserved to insure public works.</p> <p>Government dependency administrators are free to decide from whom to obtain insurance for property and do not pool together to obtain better rates nor are they required to insure via the government-held insurance company. <i>There is no public funding mechanism to indemnify the poor.</i></p>	<p><i>Public assets are generally not insured, however there are instances of 5 to 6 private insurers pooling together to cover a large public entities assets, such as in the case of the Central Bank. The assets that are insured are generally insured separately.</i></p>	
	Technical	<p>Government projects should be independently reviewed at the design stage, with the aim of eliminating need for hurricane insurance.</p>				
National Disaster Office		<p>The Civil Defense has submitted a legislative package that would assure a budget for emergency response.</p>	<p><i>The Civil Defense does not promote risk reduction for insurability purposes.</i></p>			
Business and Industry	Leaders	<p>Representatives of private insurance companies participate on an Advisory Board to the Insurance Superintendent, which meets regularly and works on topics such as policies, coverage, coverage modifications, and insurance legislation.</p>	<p>Through their Risk Inspection Departments, insurance companies provide technical assistance to clients, making recommendation and evaluating their compliance. If the client does not comply the company will cancel the policy.</p> <p>Corporations, chains and franchises generally are required to have up-to-date coverage.</p>	<p><i>Public autonomous enterprises do not generally insure their assets.</i></p>	<p>Many corporations, chains and franchises have a worldwide policy that covers assets and activities in the country.</p> <p>Individual hotel chains will often pool coverage.</p>	<p>Other than financing the amount of the premium due, no other mechanisms exist.</p>

Dominican Republic
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	Members	<p>Generally, companies do not maintain savings for self-insurance purposes. However, both REFIDOMSA and CODETEL reported that special contingency funds are part of an available emergency budget.</p> <p><i>Companies using cutting edge technology are concerned about the turn around time on insurance policy claims and how this can affect recovery plans and losses in market share to better prepared competitors.</i></p>	<p><i>Often private commercial properties are not insured to actual value, but to the amount remaining on the loan principal.</i></p> <p><i>An estimated 20% of private companies, which are generally, corporations, chains and franchises, have business interruption insurance.</i></p>			

References

The information generated is the product of:

- 5 The consultant's (Christine M. Herridge) first hand knowledge of the NGOs, Civil Defense and Private Sector vulnerability identification and reduction activities as Coordinator of the Asociación Dominicana de Mitigación de Desastres (ADMD) in the Dominican Republic.
- 6 Discussions with key sources of information regarding insurance, the environment, the building code, Public Works, the National Planning Office, hotels, free zones, and the IADB programming including:
 - Ing. Simón Mahfoud, Technical Vice President, Compañía Nacional de Seguros
 - Ing. Evelio Martínez, 2nd Vice-President of Engineering, Compañía Nacional de Seguros (SEGNA)
 - Ing. Máximo Viñas, General Advisor in Health, Industrial Safety and the Environment, REFIDOMSA (the Dominican Oil Refinery, affiliate of SHELL)
 - Ing. Américo Julio Peña, Environmental Advisor to the Senate of the Dominican Republic
 - Ing. Héctor O'Reilly, President of SODOSISMICA, Technical Advisor to Public Works
 - Mr. Ivan Reynoso, Executive Director of the Santiago Chamber of Commerce and Production
 - Mr. José Almonte, Director of Industrial Safety and Quality, CODETEL/VERIZON
 - Mrs. Paula Dimitri, Executive Director of the Santo Domingo Hotel Association
 - Ing. José Alarcón, Coordinator of the Risk Management and Zoning Component of the Technical Secretariat to the Presidency's Disaster Prevention Sub-Program
 - Mrs. María Rodríguez, Head of the Environmental Planning Department of the National Planning Office

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

GRENADA

Grenada

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society (Communities and their organizations)		Population groups aware of some hazards from local and historical knowledge of areas. 1988 OAS study identified some vulnerable areas. <i>Need for training in hazard identification.</i>	Some population groups aware of their vulnerability. Agency for Rural Transformation conducting training sessions for some communities. NERO assists. <i>NERO feels the need to work more closely with groups in communities to identify their vulnerability.</i> <i>Some development located in hazard-prone areas. The extent of the problem cannot be confirmed without hazard and vulnerability maps.</i>		Forestry conducts some training sessions to identify and protect environmental systems via Grenada Community Organization and Grenada's Agency for Rural Transformation.	
Local Government	Policy					
	Technical					
Local Disaster Committees			Some committees have identified vulnerable groups in their areas.			
National						
Central Planning and Sectoral Agencies	Policy	National Mitigation Council established in 1999 under World Bank Project.		Some vulnerability issues addressed in EIA request.	<i>There is no umbrella environmental legislation and no single environmental agency. Therefore, there is no comprehensive approach to dealing with issues.</i>	
	Technical	Seismic Unit in Trinidad providing maps to identify areas vulnerable to impact of Kick 'em Jenny (tsunami) and Mt. Catherine volcanoes.		<i>No vulnerability assessments carried out except for shelters.</i> <i>Shelters not assessed for locational vulnerability and some located in areas vulnerable to landslides and floods.</i>	Causes of environmental degradation identified. In Grand Anse, increase in number and frequency of flooding and landslides from heavy rain due to development practices on hillsides and lack of drainage outfalls to the sea. <i>Serious environmental degradation in Carriacou due to uncontrolled grazing.</i> <i>Improper solid waste disposal in St. Georges blocks rivers and contributes to flooding. Sanitary landfill constructed in 2000/2001 damaged by landslide in 2001 and now unusable.</i> <i>No capacity for water quality testing and monitoring.</i>	

Grenada

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
<i>National Disaster Office (Established in 1996)</i>			Vulnerability assessments of shelters under CDMP. ²⁶ CPACC climate change project ²⁷ produced list of critical facilities along the coast. <i>No inventory of critical facilities except shelters.</i>	NERO promotes awareness of links between hazards and the environment. <i>No disaster management legislation in place.</i>	
<i>Business and Industry</i>	<i>Leaders</i>				
	<i>Members</i>				

²⁶ USAID/OAS Caribbean Disaster Mitigation Project, www.oas.org/cdmp

²⁷ GEF/World Bank/OAS Caribbean Planning for Adaptation to Climate Change, www.cpacc.org

Grenada

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
Civil Society (Communities and their organizations)		<i>People not sufficiently aware of safe building techniques and there are very few skilled builders.</i>	National Development Foundation organizing training for builders in use of building code.			<i>Appropriate building materials not easily available; eg hurricane straps not sold locally even though retrofitting encouraged.</i>
Local Government	Policy					
	Technical					
Local Disaster Committees		<i>No hazard maps available.</i>	<i>Need for people with appropriate skills and training to understand mitigation issues.</i>			

Grenada

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p><i>Existing planning legislation does not bind the Crown and some public buildings do not pass through planning system to ensure conformity with Code/standards/guidelines.</i></p>	<p>Prior to preparation of Building Code, Physical Planning Unit used Regulations under existing legislation and Development Standards prepared in-house to guide development and construction. Historical information also used to assess applications.</p> <p>OAS/CDMP provided support to develop Building Code in 2000. Implemented for one year on a trial basis. Building Review Committee collating comments to amend Code.</p> <p>Revised planning legislation going before Parliament in early 2002, which provides for Building Code and National Physical Development Plan to be adopted under the Act.</p> <p>1999 Physical Environmental Management Plan for Carriacou and Petit Martinique include some hazard information using historical data and local knowledge of hazard events.</p> <p>National Physical Development Plan prepared and recently accepted by Cabinet.</p> <p><i>Building Code does not deal with locational issues or how to identify and avoid vulnerable locations.</i></p>		<p>EIAs requested although planning legislation doesn't specifically mandate it.</p> <p>Revised planning legislation includes provision for EIA and will go before Parliament in early 2002.</p> <p>Some protection for environmental systems eg via National Forestry Policy (1999) and Marine Parks Unit of Fisheries Division.</p> <p><i>EIA process not fully institutionalised at this time.</i></p> <p><i>Shortage of resource persons in Physical Planning Unit to evaluate EIAs.</i></p>	
	Technical	<p><i>No local capacity to develop hazard maps.</i></p>	<p>Some trained building inspectors to enforce and monitor implementation of building code.</p> <p><i>Insufficient staff at Physical Planning for monitoring and enforcement.</i></p> <p><i>National Disaster Coordinator feels there is insufficient capacity to evaluate development locations, particularly the soil conditions.</i></p> <p><i>Leads to houses built in clay soils and cracking.</i></p>			

Grenada

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
<i>National Disaster Office</i>			NERO working with business community to increase their awareness.		Some sensitivity at the national level to the relationship between environmental issues and natural hazards. NERO represented on most environmental initiatives. NERO working on draft environmental legislation based on CDERA model.	
<i>Business and Industry</i>	<i>Leadership</i>			In 2001 NERO initiated Private Sector Disaster Management Committee. Now being structured. Large companies like Cable and Wireless have disaster management plans. Smaller companies asking NERO for assistance to prepare Plans after NERO worked to increase their awareness.		
	<i>Members</i>		<i>Insurance industry not very responsive since Grenada has not faced a major hazard in decades.</i> <i>No premium reductions offered for development including mitigation measures or retrofitting.</i> <i>Grenada Development Bank started project with CDB assistance in 1998/9 to offer loans for retrofitting homes.</i>		NERO is working with hotel and tourism industry to understand environmental issues and their relationship to natural hazards.	

Grenada

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
<i>Civil Society (Communities and their organizations)</i>		<p><i>NGOs are not involved in risk transfer.</i></p> <p><i>There are no alternatives to insurance be it contingency credit or contingency equity. The clientele is not that sophisticated or knowledgeable.</i></p> <p>A few churches operate a "loose" form of self-insurance for their parishioners through informal welfare schemes</p> <p>Some churches build up contingency funds for providential purposes.</p> <p><i>NGOs are not involved in housing or property development.</i></p>	<p>There is no group insurance for homeowners. Homeowners and investors depend entirely on the property insurance market, although some carriers cannot buy adequate reinsurance.²⁸</p> <p>Most properties in the middle and upper income groups are comprehensively property insurance to actual value as this forms part of the mortgage agreement.</p> <p>About 75% of properties in the lower income group are insured because premium rates are relatively low in the market.</p> <p><i>Some properties are uninsurable due to building standards, type of material used and vulnerability – low-lying areas, on precipitous areas.</i></p> <p>Unlike the motor insurance industry, <i>there is no compulsory insurance for private properties.</i></p> <p><i>Given Grenada's vulnerability to volcanic actions, there is need for compulsory insurance for properties.</i></p>			<p><i>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</i></p> <p>Commercial properties, particularly, hotels that are part of international chains, may be using risk financing options that allow multi-year coverage that would result in stabilizing premiums.</p>
<i>Local government</i>	<i>Policy</i>	[There is no local government body. All activities are prosecuted by a national agency.]				
	<i>Technical</i>					
<i>Local Disaster Committees</i>						

²⁸ Estimates were provided by David Phillip, managing Director, NALGICO, one, of the leading property underwriter in the market.

Grenada

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<p>Government does not allocate contingency funds in its annual budget based on actuarial probabilities.</p> <p>A contingency fund was set up in 1999 but no transfer is being made.</p> <p>NB: The absence of deliberate risk transfer policy may be due to the fact that the country has not had a major disaster (fire, volcanic or windstorm) since the passage of Hurricane Janet in 1955.</p> <p>Government will be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</p>	<p>The insurance regulatory function is inadequate. The office is poorly staffed but is equipped with a fair amount of technical skill. Skills in risk management however are limited.</p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department. However there are no hazard maps governing insurer's levels of catastrophe peril liabilities, no functional linkage between the physical planning and the insurance regulation, and very little enforcement.</p> <p>The insurance regulator needs to:</p> <p>(i) have the capacity to do catastrophe premium pricing.</p> <p>(ii) educate with respect to reducing the financial impact of events and minimizing the probability of avoidable losses.</p>	<p>Government has no policy for insuring public assets. Only vehicles are insured.</p> <p>The public properties, which are insured, are covered under the specific loan conditions and lease arrangement.</p> <p>There is no public fund or mechanism established to indemnify the poor or to provide incentive for undertaking mitigation measures.</p> <p>Government needs to explore the feasibility of</p> <p>(i) Investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</p> <p>(ii) Providing incentives for catastrophe risk coverage for low-income groups particularly those occupying areas prone to landslide such as squatters.</p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • Government Headquarters • The Financial Complex • The ministerial Complex • The National Stadium <p>NB: All other public assets are not insured.</p>	<p>Government sources external credit for reconstruction and mitigation efforts.</p> <p>Additional contingent credit facilities could include:</p> <p>(i) World Bank Economic Recovery Facility</p> <p>(ii) CDB Disaster Mitigation Facility</p>
	Technical					

Grenada

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National Disaster Office		<p>Budgetary allocations are made towards the National Emergency Relief Organization (NERO) only for operations. <i>No emergency funds are deployed for contingencies.</i></p> <p>Government has EC\$1.9 millions in a Fiscal Tranche at the Central Bank, which is a contingency fund.²⁹</p> <p><i>NERO depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>NERO promotes risk reduction through the national committees, public education and awareness programs mainly during the hurricane season.</p> <p><i>NERO needs to:</i></p> <p>(i) <i>To embark on a broad based insurance, risk management and disaster preparedness education programme</i></p> <p>(ii) <i>To emphasize retrofitting, maintenance and building standards and insurance coverage</i></p>			
Business and Industry, Financial	Leaders	<p><i>There is no society-wide Advisory Council.</i></p>	<p><i>Insurance companies do not provide incentives to homeowners such as lower premium rates for risk reduction not for risk assessment and management checks.</i></p>	<p><i>Public autonomous enterprises under the management of the central government such as Water and Electricity are not adequately insured because of expectations in the insurance market.</i></p> <p>Statutory bodies such as the port are insured to actual value.</p> <p><i>Pooling method would most be appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p>Nutmeg: There is a certain measure of risk transfer mechanism or self-insurance. This is associated with the capitalization of the Cooperative, which manages the production, and marketing of the export crop.</p> <p><i>Reserving is however never sufficient to bail out the industry in difficult periods.</i></p> <p>Tourism: <i>There is no risk transfer mechanism or self-insurance for locally owned properties.</i></p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower cost through increased portfolio.</i></p>	<p><i>Alternative risk financing for the business and industry would involve:</i></p> <p>(i) <i>Allocation of capital reserve during the profitable years to be used as collateral for debt financing for reconstruction effort.</i></p> <p>(ii) <i>Use of capital market instruments to generate raise equity capital for the recovery effort</i></p> <p>(iii) <i>Creation of a venture capital fund to supplement recoveries from business interruption insurance.</i></p>

²⁹ ECCB Credit Market Report, Feb 15, 2002

Grenada

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>Leadership should be provided by the private enterprises that are leaders in financial management particularly the insurance sector.</i></p>	<p>About 100% of company buildings are insured to actual value because the terms and conditions of the debt capital require building standards are strictly adhered to at all stages of the construction.³⁰</p> <p>About 100% of company buildings are insured against all perils and are built in accordance with building standards</p> <p>In most cases, commercial properties are insured to their actual value to meet the conditionalities of the overdraft facilities.</p> <p><i>No coverage is taken for business interruption, given the low incidence of disaster since 1955.</i></p> <p><i>Private firms do not cover compensation for employees.</i></p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p> <p><i>There is need for more forward planning by the private sector.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant's first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mr. Dennis Clarke, Director of Economic Affairs, Ministry of Finance and Planning, St George's, Grenada.
 - David Phillip, Managing Director, NALGICO, St George's, Grenada.

³⁰ Estimates were provided by David Phillip, Managing Director, NALGICO, one, of the leading property underwriter in the market.

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

JAMAICA

Jamaica

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society <i>(Communities and their organizations)</i>		<p>Communities have basic information about hazard vulnerability and considerable historical information about hazard prone areas.</p> <p>Some community groups trained in use of hazard maps (eg Portland.)</p> <p>Maps have guidelines for interpretation and use.</p> <p>Population groups aware of hazards.</p> <p>UWI working on atlas of small communities, starting with Kingston and St. Andrew. Community groups to provide them with information useful for when building or buying homes.</p> <p><i>Generally, there is poor distribution of hazard maps and a need to translate technical information on maps into more useful format for use by community groups.</i></p> <p>Community training only done as part of individual projects and is not sustained or sufficiently widespread.</p>	<p>Communities aware of vulnerability.</p> <p>Informal identification of vulnerable sub-groups (eg via churches knowledge of elderly and disabled.)</p> <p><i>No formal identification of vulnerable sub-groups.</i></p>	<p>Vulnerability assessments based on first hand knowledge of community members.</p> <p>Rio Minho landslide map includes location of critical facilities.</p>		
Local Government	Policy			Disaster Coordinator maintains database of shelters and remedial action needed.		
	Technical	<p><i>Need hazard maps to cover all of Portland and other parts of country.</i></p> <p><i>Maps need to be made more user friendly by inserting missing descriptions, altering level of detail to reflect user groups.</i></p>				
Local Disaster Committees <i>(exist in most but not all communities)</i>		<p><i>Few committees have copies of hazard maps.</i></p> <p>Some training in use of maps started in Portland.</p> <p><i>Poor distribution of maps to communities.</i></p>	Committees identify vulnerable groups.	Assist ODPEM to maintain database of shelters.		

Jamaica

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
Central Planning and Sectoral Agencies	Policy	<p>National Mitigation Programme headed by ODPEM. National Mitigation Policy to be completed by end 2002 with assistance from CDB.³¹</p> <p>National Disaster Committee chaired by Prime Minister, includes all government ministries and NGOs with ODPEM serving as secretariat.</p>		<p>Critical facilities reviewed by Public Works. If located in vulnerable areas, PWD uses structural measures and regular maintenance to mitigate potential impacts.</p> <p><i>Location of critical facilities in hazard prone areas need to be reviewed. Many older buildings were never subject to vulnerability assessments.</i></p>		
	Technical	<p>Available hazard mapping includes Landslides for sections of Portland, Rio Grande, Kingston metropolitan area, St. Mary and Clarendon and Rio Minho (more detailed maps exist for heavily populated areas); rudimentary earthquake; river flooding for areas historically prone to hazard (eg Rio Cobre); wind damage for Kingston; storm surge for Kingston, parts of St. Catherine and Montego Bay.</p> <p>Maps generated by many agencies, including UWI Department of Geology and Geography.</p> <p>UWI produced Jamaica South Coast Sustainable Development Strategy as part of the Halcrow Geology and Natural Hazard Report (1998). This also covered earthquake, flood and hurricane hazards in the area.</p> <p>Major agencies such as Departments of Mines and Geology, Water Resources Authority, NEPA and ODPEM have most of the hazard maps.</p> <p>Water Resources Authority produce flood plain maps and use to inform their comments on development applications.</p> <p>NEPA and Forestry Divisions have</p>		<p>Ministry of Health has list of critical health facilities and Ministry of Works has list of roads and bridges. Any vulnerability assessments only rudimentary.</p> <p>Water Resources Authority maintains functional database of sewage plants which is geo-referenced and includes photos.</p> <p><i>Need to develop comprehensive vulnerability assessments of all critical facilities.</i></p>	<p>NEPA has atlas identifying all ecosystems in the country.</p> <p>Indicators of environmental degradation developed. Some based on UN trends and indicators.</p>	

³¹ Caribbean Development Bank.

Jamaica

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
	<p>very good GIS capacity and experienced staff.</p> <p>UWI has prepared guidelines for use of Kingston Landslide maps. Available on UWI website to increase accessibility.</p> <p><i>Need for more hazard maps at appropriate scales to support decision making and evaluation of development proposals.</i></p> <p><i>More technical data needed to support the vulnerability assessment process.</i></p> <p><i>Need to use hazard maps.</i></p>				
National Disaster Office	<p>Hazard mapping started in early 1990s. Previously used rudimentary multi hazard maps based on historical data.</p> <p>Hazard maps available for flooding.</p> <p>ODPEM trying to develop GIS capability in-house. Acquired Arc Info and ArcView and some hardware.</p>	<p>ODPEM doing vulnerability assessments for areas in Portland impacted by flooding and landslides in December 2001. Recommended rehabilitation strategies and some relocation.</p>	<p><i>No comprehensive list of critical facilities in one database.</i></p>		
Business and Industry	Leaders	<p>Insurance Company of the West Indies has disaster wardens and provides training for them. UWI Department of Geology and Geography conducted workshop for them on Understanding Natural Hazards and Disasters in early 2002.</p> <p>Institute of Engineers conducts workshops to sensitize insurance industry to risks.</p>	<p>Local bauxite companies get involved in local disaster initiatives.</p> <p><i>Not formal members of local disaster committees.</i></p>		
	Members			<p>Jamaica Light and Power Company maintains GIS database of facilities, including information about each pole and has capacity to relate this to location of hazard prone areas.</p>	

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
Local					
<i>Civil Society (Communities and their organizations)</i>	<p>Construction Resources Development Centre (CRDC) Project in 1990s built houses and created video of critical stages in the construction process to show assembly of timber houses.</p>	<p>Use of community expertise is used to develop strategies, eg use of personal initiatives to reduce impact of flooding in Gordon Town.</p> <p>Houses built on supports in rural areas to reduce impact of flooding.</p> <p>In Nightingale Grove (Portland), roof level used as height of floor level for new buildings depending on depth of floods.</p> <p>Workshops organized by national and local groups, including Jamaica Institute of Engineers to sensitize people to National Building Code and how to use it.</p>	<p>ODPEM working to incorporate disaster management measures into school curricula from primary level.</p> <p>NEPA linked census data to watersheds to identify households in poverty who live in vulnerable watersheds.</p> <p>Environmental issues integrated into school curricula. Comprehensive Environmental Education Project includes some disaster management.</p> <p>NEPA now preparing classroom resource manuals.</p> <p>UWI conducts summer Certificate course in Geo-Hazards, MSc in Environmental Management and degree courses in Geography and Geology incorporate natural hazard management and GIS.</p> <p><i>Due to lack of funding, vulnerability reduction measures in flood- and landslide-prone communities lags far behind what is needed.</i></p> <p><i>More awareness of need for mitigation approach needed. People still stuck in response and recovery mode.</i></p> <p><i>Need for cultural change to improve perception of importance of disaster issues.</i></p> <p><i>NEPA would like to see ODPEM build on initiatives to include disaster management in school curricula and extend to teacher training institutions to complete infusion process.</i></p>		<p>Appropriate building materials easily available at reasonable cost.</p> <p>Flood damage assessments in Rio Cobre community.</p>

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
<i>Local Government</i>	<i>Policy</i>		Parish Council prepares mitigation programme with guidelines from ODPEM.	ODPEM requires Parish Councils to prepare Parish Disaster Plans and guides their programmes. Parish Disaster Committee is a standing committee of the local authority. Each chaired by Parish Disaster Coordinator who maintains links with Regional Officers at ODPEM.	Parish Environmental Profile prepared for Portland in 2000.	

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>		<p>Applications for development approval received by Director of Planning at Parish Council (the local authority is responsible for planning) and sent to NEPA for review.</p> <p>Undertake regular drain maintenance.</p> <p>Produce leaflets on how to build timber houses and small concrete houses.</p> <p>Local Authority Inspectors attend training seminars conducted by Institute of Engineers under internationally funded projects.</p> <p>Local Authority staffed by graduates from UTECH with construction industry training.</p> <p>Flood markers and gauges in some areas eg Rio Cobre, Yallas River, Rio Minho and Rio Grande Valley. Information use to create flood hazard maps.</p> <p>Flood Warning System in Rio Cobre and Thred Park communities, where colour coded gauges used and telemetric rain gauges feed data to computers at Water Resources Agency. Information passed on to ODPEM. Flood Alert system in Portland.</p> <p><i>Lack of manpower in Parishes to do adequate building inspection.</i></p> <p><i>Professional Engineers Registration Act requires engineers to be registered to design large buildings. Not well implemented. Doesn't include small buildings.</i></p> <p><i>Data derived from telemetric rain gauges in Thompson Pen area but information not available to calibrate models.</i></p>			

Jamaica
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
<i>Local Disaster Committees</i>			<p>ODPEM's strategy is to develop consistent disaster management organizations at community level.</p> <p>Zonal committees exist and are most active in most vulnerable areas. Zonal chairperson links with Parish Disaster Coordinator and sits in on Parish Disaster Committee meetings.</p> <p>Parish Disaster Committees comprise members drawn from wide cross section of government agencies and NGOs.</p> <p>Organize evacuation programmes to reduce vulnerability of population.</p> <p><i>There is a lack of funding to undertake hazard mitigation programmes.</i></p>		

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p>New public buildings conform to Jamaica National Building Code, since they are designed by professional engineers who adhere to Code</p>	<p>1983 Jamaica National Building Code (based on CUBIC) published as a Green Paper (ie endorsed by government but not made law.) Code now being revised. Also use CUBIC and California Codes.</p> <p><i>Committee set up to review 1983 Building Code has stalled due to confusion over which agency should be responsible.</i></p> <p>Bureau of Standards developed standards for building materials.</p> <p><i>70 percent of buildings not approved via formal planning system and most not built by trained contractors.</i></p> <p>Development standards adequate to guide development in vulnerable areas.</p> <p><i>Hazard maps very generalized and cannot be used for many site specific development applications.</i></p> <p><i>Hazard information needs to be fully integrated into land use planning and development process.</i></p>		<p>EIAs required for projects and include request for hazard information.</p> <p>Jamaica's Environment 2001 - Environmental Status and State of the Environment Report prepared in 2001.</p> <p><i>National Environment and Planning Strategy to be prepared. Will outline an approach to mitigation.</i></p> <p><i>Need to further explore forest degradation and impact on flooding and landslides.</i></p> <p><i>Degradation of environment due to agricultural practices, coal and wood-fire burning and human settlements.</i></p>	<p>Over 50 percent of government agencies have disaster plans.</p>

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	Technical	<p>Widespread use of gabion baskets to strengthen river banks.</p> <p>River training done in Portland to contain river in its natural course. More widespread than building sea defenses.</p> <p>Regular drain maintenance by government.</p> <p>Retaining walls (not widespread) used to reduce impact of landslides.</p> <p>Use of hurricane straps and appropriate design to reduce impact from wind damage.</p> <p>Bureau of Standards has building materials committee, which publishes standards for building materials.</p> <p>Qualified staff graduates from UWI and/or UTECH.</p> <p><i>Certain housing agencies design and build housing without always passing through local authority approval system.</i></p>	<p>Monthly roundtable discussion held to evaluate development applications informally including various agencies and ODPEM.</p> <p>Slope stabilization with plants to reduce soil erosion used to reduce impact of landslides.</p> <p>Other appropriate mitigation measures suggested by ODPEM after site visits.</p> <p>NEPA uses hazard maps to impose conditions in planning approvals. Some areas for which hazard maps exist are not a priority for preparation of development plans.</p> <p>Some guidelines prepared by NEPA to guide development in vulnerable areas, such as St. Ann's.</p> <p>Staff at many government agencies such as ODPEM and NEPA trained in natural hazard issues as graduates of UWI.</p> <p><i>Need to develop building and development standards based on hazard and vulnerability information.</i></p> <p><i>National Building Code only addresses structures without emphasis on other issues like flooding, vulnerable locations or seismic hazards.</i></p> <p><i>Efforts to produce a volume of the building code dealing with small buildings were not successful. Need for guidelines for small buildings.</i></p> <p><i>Code not very well publicized and not all professionals have copy or use it.</i></p>	<p>On-going UWI project to build awareness of landslides, empower people and develop a computer-based expert knowledge system.</p> <p>Flood Water Control Master Plan being prepared in consultation with stakeholders.</p>	<p>NEPA uses Sustainable Watershed Management as a mitigation tool.</p> <p>Environmental policies developed to protect some ecosystems eg Ridge to Reef Project, Watershed Management Project in Rio Grande and Great River watersheds and Trees for Tomorrow Project in Portland, Portland.</p> <p><i>More work needed to institutionalize environmental protection policies for ecosystems and to value them.</i></p> <p><i>Jamaica's coral reefs very degraded and need protection.</i></p>	<p>Hurricane Housing Act empowers Ministry of Housing to develop their own designs and housing projects after a hurricane.</p>

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics>*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
<i>National Disaster Office</i>		<p>ODPEM has Mitigation Planning and Research Unit which encourages use of mitigation strategies in planning and identifies appropriate mitigation techniques for use in vulnerable areas.</p> <p>ODPEM/MPRU works with other agencies to develop mitigation strategies.</p> <p>ODPEM works with umbrella agencies to assist them to develop disaster plans.</p> <p>ODPEM involved in development review/approval process, especially in areas known to be vulnerable, to integrate hazard information into process.</p> <p>ODPEM encourages use of reputable engineers and contractors who are familiar with and build according to Code.</p>	<p>Variety of in-house technical expertise available.</p> <p>Use of awareness days such as Earthquake Awareness Day (ODPEM) to sensitize public.</p> <p>Hosted nationwide 2001 schools competition (primary and secondary) to prepare hazard map for the community in which school located, design posters and build models to show how community was affected by hazards and what mitigation measures used.</p>		<p>ODPEM documents impacts of hazard events.</p> <p>2001 floods in Portland assessed to cause JAS\$2-3 billion in damage.</p>

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
<i>Business and Industry</i>	<i>Leadership</i>		<p>Work with Regional Disaster Coordinators attached to ODPEM.</p> <p><i>Insurance industry has used information about risks and vulnerable areas to increase premiums.</i></p> <p><i>Companies not offering premium reductions for use of risk reduction measures or retrofitting techniques.</i></p>	<p>Tourism Product Development Committee requires hotels to develop disaster plans to be certified for hotel operation. Plans must be sent to ODPEM for approval.</p> <p>Red Cross initiated a project to encourage hotels to write plans. Not very successful.</p> <p>Sandals hotel has a hurricane plan (not done on group/chain basis).</p> <p>Petroleum industry required to have disaster plans. Also prepare guidelines for haulers and contractors as required by their parent companies. Ministry of Mines requires companies to lodge a copy of their plans with ODPEM.</p> <p>Awareness and Preparedness for Emergency at Local Level: Programme provides for evacuation of nearby communities in event of disaster. Developed following incident in Bhopal.</p> <p><i>No incentives offered by insurance sector.</i></p>		<p><i>Very few hotel disaster plans submitted to or approved by ODPEM.</i></p>

Jamaica

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Members</i>	<p>Grace Kennedy group assesses vulnerability of buildings and structures. Contract safety engineers to conduct regular audits of buildings and report to the company and the Safety Council. Reports included as agenda item of main GK Board meetings. Remedial measure quickly implemented.</p>	<p>Grace Kennedy Group has Group Disaster Preparedness Committee comprising representatives from many group companies and divisions. Conduct annual Group Disaster Preparedness Seminar.</p>	<p>Businesses participate in training programmes.</p> <p>Communications media offer concessionary rates for public information, awareness days and other projects.</p> <p>Cable and Wireless and Texaco sponsored simulation exercise for Portland Evacuation Plan.</p> <p>Grace Kennedy has Disaster Manual, prepared with assistance from ODPEM in 1990/1. Updated regularly as a living document. Plan identifies company resources and information on families of key staff. Frequently test for state of readiness for each company.</p> <p>Grace Kennedy Group participates in public education programmes to increase awareness of disaster issues and retrofitting techniques.</p>		<p>Grace Kennedy group has Contingency/Business Continuity Plan. Companies can get workers and their families home safely or to a safe place. Supplies available for key personnel who man stations.</p> <p><i>Individual hotels have no formal hurricane plans.</i></p>

Jamaica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget/Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society (Communities and their organizations)		<p>One housing-related NGO offers some information about hurricane resistant improvements.</p> <p><i>Due to financial and other constraints, one housing-related NGO, CR&DC, has virtually abandoned mission to provide hurricane-resistant home improvement programmes to reduce vulnerability reduction and attention to building standards. Revolving loan financing was not available.</i></p> <p><i>Churches and other community organizations do not appear to have vulnerability reduction as part of their on-going programmes.</i></p>	<p>About 30-50% of houses in the formal sector are insured. Most houses in the informal sector are uninsured. Some commercial properties are insured. <i>Many small business enterprises do not carry insurance against natural disasters. Per capita spending on non-life insurance in 1997 was estimated at US\$76.³²</i></p> <p><i>Long-term savings to meet educational goals more widespread than is planning for natural disasters on a sustained basis.³³</i></p> <p><i>Compulsory insurance against natural disasters for properties is not mandated by law.</i></p> <p><i>Catastrophe insurance penetration across all sectors estimated at below 50 percent.</i></p>			<p><i>Traditional methods to finance risks are under-utilized for a variety of reasons. The demand for alternative methods is therefore likely to be non-existent due to knowledge gaps and the current stage of development of the market.</i></p>
Local government	Policy	<p><i>Risk management perceived to fall exclusively within the ambit of National Disaster Office [OD-PEM] and not at the institutional level.</i></p>				
	Technical					
Local Disaster Committees						

³² Stephens, Cedric E., *Catastrophe Insurance in Jamaica: A Review of the Period 1989-1998 and Non-Life Insurers: are they playing an effective role ...?*

³³ Ignorance about the nature of the risks and expectations of donor support could be contributors to the low rate of insurance penetration.

Jamaica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>	<p>Funds allocated in annual budget for environmental planning and disaster management based on disaster plans. <i>Budgetary constraints preclude complete provision.</i></p> <p><i>Actuarial assumptions do not apparently underlay funding provisions.</i></p> <p><i>Funding provisions are limited due to budgetary constraints.</i></p> <p><i>Risk management perceived to fall exclusively within the ambit of National Disaster Office [OD-PEM] and not at the institutional level.</i></p> <p><i>The creation of private catastrophe reserves by way of tax incentives are not encouraged either to insurers or other enterprises.</i></p>	<p>New insurance regulatory authority, Financial Services Commission, is in early stage of organization after 30-year old Act repealed and replaced by Insurance Act 2001. Staff and other resources are being upgraded. New funding arrangement in place.</p> <p><i>The main focus of the insurance regulatory authority has tended to be in relation to the solvency of players in the market place. The agency has developed no explicit policies to manage systemic risks posed by natural disasters, catastrophe-pricing policies or to ensure fair access to coverage.</i></p>	<p><i>Policy on public asset coverage appears to be concerned largely with procurement procedure compliance rather than with management of catastrophe risks.</i></p> <p>Central government assets self-insured.</p> <p>Assets of public corporations covered by private market.</p> <p><i>Policy in relation to public asset coverage seems to be concerned exclusively with compliance with procurement guidelines than with mitigating risks.</i></p>	<p><i>Public insurable assets are covered on an institution-by-institution basis with no attempt at pooling.</i></p> <p><i>Policy in relation to public asset coverage seems to be concerned exclusively with compliance with procurement guidelines than with mitigating risks.</i></p>	<p>External financing sought ex-post event to address reconstruction and restoration.</p> <p><i>Financing mechanisms restricted exclusively to ex-post disaster financing – no emphasis on pre-event financing.</i></p>
	<i>Technical</i>	<p><i>Persons occupying marginal lands should be relocated.</i></p>				
<i>National Disaster Office</i>		<p>Disaster office promotes the use of hazard information development and investment decisions.</p>	<p>Promotes risk reduction, with the emphasis on saving lives.</p>			
<i>Business and Industry, Financial</i>	<i>Leaders</i>	<p><i>Insurers, lenders, Chamber of Commerce and community leaders, most of whom belong to umbrella organization, PSOJ, have not formed advisory council to Financial Services Commission, to promote best practices for catastrophe perils and vulnerability reduction methods. FSC board comprises ex-government sector officials almost exclusively.</i></p>	<p><i>Insurers do not promote schemes that provide incentives for risk reduction or implement creative plans to educate consumers about risks of natural disasters and stimulate demand. Market for insurance against natural disasters very volatile.</i></p>	<p>Most autonomous enterprises insured with private insurers.</p>		

Jamaica

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<i>Enterprises very dependent on loan financing.</i>	<p>Some commercial properties are insured. <i>Few business interruption insurances are sold.</i></p> <p><i>Private commercial properties that are not subject to lending agreements may not be insured or, are only partially insured.</i></p> <p><i>There is no legislation mandating compulsory insurance except in the case of motor vehicles. Business interruption insurance is not sold to private enterprises as much as it should due in part to ignorance about the subject.</i></p>			

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps—St. Kitts and Nevis**

ST. KITTS AND NEVIS

St. Kitts and Nevis

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society <i>(Communities and their organizations)</i>		<p>A suite of hazard maps prepared in 2001 for St. Kitts and Nevis under PGDM.³⁴ Planning Department considering fee structure to charge for access to maps.</p> <p>NEMA's public relations officer developing a public awareness campaign, which will publicize maps.</p> <p>Local groups in St. Kitts and Nevis have basic training to identify hazards and vulnerable areas.</p> <p><i>Community groups not widely aware of hazard mapping.</i></p> <p><i>Hazard maps not yet provided to communities</i></p>	<p>Community groups in St. Kitts and Nevis aware of some vulnerable areas. Communities on volcanic slopes less aware of potential danger than those in coastal areas.</p> <p>Religious and service groups in St. Kitts and in Nevis support NEMA in disseminating information and promoting public awareness via street banners and hurricane preparedness messages.</p> <p>Red Cross discussing with NEMA the possibility of establishing Nevis as a focal point for distributing relief supplies for the region.</p> <p><i>Significant amount of housing in vulnerable coastal areas and on lower slopes of hills.</i></p>	<p>Vulnerability studies done in 2001. International Labour Organization (ILO) consultant working on training programmes for vulnerability assessments.</p> <p><i>Information from vulnerability assessments not being used much by NEMA.</i></p>	<p>High levels of awareness of environmental systems and their importance but still not taken seriously.</p> <p><i>General public may not be aware of extent of damage to some systems like coral reefs.</i></p>	<p><i>No formal risk assessment carried out to identify vulnerable groups and settlements.</i></p>
Local Government	Policy	n.a.				
	Technical	n.a.				
Local Disaster Committees		<p>8 disaster districts in St. Kitts and 5 in Nevis.</p> <p>Committees host public workshops on topics including purpose of hazard mapping.</p> <p>Promoting preparation of community disaster plans.</p> <p><i>Committees in Nevis have no direct interaction with the Disaster Coordinator at NEMA in St. Kitts.</i></p> <p><i>Hazard maps not yet distributed to disaster committees in St. Kitts or Nevis.</i></p>	<p>No formal risk assessment conducted but Committee members and communities have much local and historical knowledge.</p> <p><i>No formal risk assessments conducted.</i></p>			

³⁴ USAID/OAS Post-Georges Disaster Mitigation in Antigua/Barbuda and St. Kitts/Nevis, www.oas.org/pgdm

St. Kitts and Nevis

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
Central Planning and Sectoral Agencies	Policy	<p>National Disaster Mitigation Council established. Chaired by Deputy Prime Minister.</p> <p><i>Hazard maps not distributed to government agencies.</i></p>		<p>Vulnerability assessment carried out for new projects under 2000 Planning Act.</p>	<p>Good environmental legislation to protect environmental systems.</p> <p>Country Environmental Profile done in 1998. Identifies environmental systems, assesses them and deals with incidence of degradation and causes.</p> <p>Department of Environment did recent workshops with wide cross section of stakeholders on land degradation.</p> <p><i>Environmental legislation not adequately enforced due to lack of political will and human resources.</i></p>	<p>NEMA encouraging government agencies to inventory physical assets, especially as part of post disaster assessment.</p> <p><i>Inventories of physical assets not widely done.</i></p>
	Technical	<p>Consultant engaged at Physical Planning Department under PGDM to prepare hazard maps.</p> <p>Physical Planning Department preparing National Land Policy and intend to incorporate hazard maps.</p> <p>Physical Planning Department produced maps for Agriculture Department to show areas of soil infertility and susceptibility to erosion.</p> <p><i>Hazard mapping not institutionalized as maps prepared by consultants.</i></p>		<p>Preliminary assessment of housing sector done in 1999/2000 by NEMA on advice of National Mitigation Council.</p> <p>Most assessments done in relation to coastal areas and rivers.</p>		
National Disaster Office		<p>Employs District Coordinator to coordinate community pre- and post-disaster activities.</p>				

St. Kitts and Nevis

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Business and Industry	<i>Leaders</i>	<p>Sub-committees of National Mitigation Council (eg food clearance and shelter management committee) have representation from business community and identify issues of concern to them.</p> <p>Links between business community and Ministries of International Trade and Commerce also facilitate identification of issues and offers of cooperation between business and government.</p>	Some involvement from business community/private sector in disseminating information and relief supplies.			
	<i>Members</i>					

St. Kitts and Nevis
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
Local					
<i>Civil Society (Communities and their organizations)</i>		<i>Some development located in hazard-prone areas.</i>	Clarence Fitzroy Bryant College to introduce part time course in disaster management. CDERA assistance sought to introduce hazard and vulnerability reduction information into schools. Duty free allowances on building materials to facilitate repair of hurricane damage used to accommodate low income groups. <i>Hazard information not yet incorporated into school curricula in Nevis. Need for teachers to be trained to get disaster management issues into secondary school syllabus.</i>		Appropriate building materials available in St. Kitts and Nevis.
<i>Local Government</i>	<i>Policy</i>				
	<i>Technical</i>				
<i>Local Disaster Committees</i>			<i>Committees have no contingency plans.</i>		

St. Kitts and Nevis

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p>Since 1995, Government policy that all its buildings have hurricane resistant windows.</p> <p>After hurricane Georges, government built 400 starter homes at cost of EC \$27,000 for persons whose homes were destroyed.</p> <p>Government built several housing projects since 1995 with hurricane resistant techniques.</p> <p>New hospital being rebuilt after hurricane Georges with complete mitigation in mind.</p> <p>World Bank funding construction of 3 multi purpose shelters in St. Kitts and 2 in Nevis.</p> <p>Government policy requires all new community centers and buildings to be built with shelter use in mind.</p> <p><i>Hazard maps not distributed to government agencies.</i></p>	<p>Development Control and Planning Act passed in Parliament in 2000. Building Code operationalised under Act. It is a Federal Building Code and covers Nevis.</p> <p>Building Code and Building Regulations (St. Kitts and Nevis, 2000) used as basis for approving development applications and is available for sale (EC\$325).</p> <p>Physical Planning has also prepared building guidelines and basic development standards.</p> <p>Physical Planning Unit in Nevis also uses hazard maps to make some decisions in coastal areas.</p> <p>Workshop in Antigua under PGDM provided training for Building Inspectors on use of Code.</p> <p>Workshop on multi-hazard building design held in St. Kitts for architects and builders.</p> <p>Physical Planning uses hazard maps and tries to incorporate information into land use policy.</p> <p>Draft National Physical Plan under review and being amended.</p> <p><i>Some land use decisions, especially for housing development still made on basis of political constituencies without incorporating land use or hazard parameters.</i></p> <p><i>In Nevis, development not consistently directed away from hazard prone areas.</i></p>	<p>Recognize link between solid waste management and vulnerability.</p> <p><i>Information from vulnerability assessments not being used much by NEMA.</i></p>	<p>New Planning Act provides for EIAs for major projects.</p> <p>Environmental systems well protected by legislation and policies, in particular mangrove and coral reefs.</p>	<p>Government provides initial funds for recovery efforts. Regional institutions and governments also assist.</p> <p>NEMA trying to encourage establishment of contingency funds.</p> <p><i>No national fund for financing recovery and no provision in budget estimates of ministries.</i></p>

St. Kitts and Nevis
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>	In 2000 public awareness programme carried out with Chamber of Commerce and community groups and other stakeholders to sensitize them to Code. Used print media and leaflets/flyers. <i>Many persons not familiar with Code. Further public awareness needed.</i>	<i>Shortage of building inspectors to enforce code.</i>			
	<i>National Disaster Office</i>	NEMA promoting use of hurricane shutters.	National Disaster Mitigation Plan developed under PGDM. Now before Cabinet. NEMA developed video for hurricane proofing homes and showing where and how to build. Video aired on TV. NEMA preparing to host a train the trainers workshop with disaster committees.	St. Kitts and Nevis Disaster Plan exists. Company disaster and recovery plans are coordinated with it. Many technical staff have no formal training in disaster management but attended many short courses and acquired considerable practical knowledge and experience. <i>NEMA not adequately staffed with technical expertise. Technical staff not formally trained in disaster management.</i>		
<i>Business and Industry</i>	<i>Leadership</i>	<i>Insufficient awareness and involvement of business community in hazard issues.</i>	Business community developed strong links with Ministry of Trade and Commerce to cooperate in disaster preparedness. <i>No premium reductions offered by Insurance companies for use of mitigation measures.</i>	Some businesses have emergency contingency plans and hotels have disaster recovery plans. Four Seasons hotel in Nevis has a contingency plan. All hotels in Nevis asked to do emergency plans by NEMA. When hurricanes approach, most hotels evacuate guests and close. Hotel and Tourism Association hold workshops to promote development of hurricane contingency plans in hotel industry.		
	<i>Members</i>		Appropriate building materials available for sale.			

St. Kitts and Nevis
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society (Communities and their organizations)		<p>NGOs and other forms of social capital (churches and community groups) are not involved in risk transfer. Their capital base do not allow for alternatives to insurance be it contingency credit or contingency equity. Moreover, the clientele is not that sophisticated or knowledgeable.</p> <p>Some NGOs, particularly churches, build up contingency funds for providential purposes.</p> <p>NGOs are not involved in housing or property development.</p>	<p>There is no group insurance for homeowners. Homeowners and investors depend entirely on the small and sometimes under-capitalized property insurance market, which, in some cases, cannot buy adequate reinsurance, to provide insurance coverage.³⁵</p> <p>About 100% of properties in the middle and upper income groups are comprehensively insured to actual value.</p> <p>About 90% of properties in the lower income group are not insured or are under-insured.</p> <p>Most properties are uninsurable due to building standards, type of material used and vulnerability – low-lying areas, on precipitous areas.</p> <p>Unlike the motor insurance industry, there is no compulsory insurance for private properties.</p> <p>Given the vulnerability of the OECS sub-region to hurricane and volcanic actions, there is need for compulsory insurance and sub-regional catastrophe pool for private properties.</p>			<p>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</p> <p>Commercial properties, particularly, hotels that are part of international chains, may be using risk financing options that allow multi-year coverage that would result in stabilizing premiums.</p>
Local government	Policy	[There is no local government body. All activities are prosecuted by national agencies.]				
	Technical					
Local Disaster Committees						

³⁵ Estimates provided by the insurance regulator and based on my knowledge of the market.

St. Kitts and Nevis
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing	
National						
Central Planning and Sectoral Agencies	Policy	<p><i>Government does not allocate contingency funds in its annual budget based on actuarial probabilities but maintains a contingency reserve, which is used for emergency purposes.</i></p> <p><i>Government would be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p><i>The insurance regulatory function is inadequate. The office is poorly staffed, poorly equipped; has no staff member trained in insurance and risk management.</i></p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department but <i>there are no hazard maps governing insurer's levels of catastrophe peril liabilities. Furthermore there is no current linkage between the Physical Planning Department and the Insurance Regulator.</i></p> <p><i>The insurance regulator needs to:</i></p> <p><i>(i) Have the capacity to do catastrophe premium pricing.</i></p> <p><i>(ii) Educate with respect to reducing the financial impact of events and minimizing the probability of avoidable losses.</i></p>	<p>Government has taken policy decision for insuring critical public properties to reduce fiscal risk. Annual premiums are estimated at EC\$2 million.³⁶ This covers public buildings, schools, hospitals, police stations, fire departments, defence force buildings, sporting complex etc.</p> <p><i>There is no public fund or mechanism established to indemnify the poor or to provide incentive for undertaking mitigation measures.</i> However government provides incentives for first homeowners in form of tax breaks, and this has served as incentives for building in accordance to building standards.</p> <p>Properties owned by the statutory bodies are insured to actual values.</p> <p>Government middle and low-income homes (part of the 1000 project) are insured with local insurance companies.</p> <p><i>Government needs to explore the feasibility of</i></p> <p><i>(i) Establishing investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</i></p> <p><i>(ii) Establishing an insurance scheme for catastrophe risk coverage for low-income groups particularly those in vulnerable areas – squatters and illegal occupiers.</i></p> <p><i>(iii) Upgrading slum projects with</i></p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • Government Headquarters • Electricity Department • Water Authority • JNF France Hospital • Community Hospital s • All Health Centres • CFB Community College • All Schools • Treasury Building • The Public Library • Coast Guard Building • Drug Squad Building • Police Training Complex • Basseterre Police Station • Football Complex • Net ball Complex 	<p>Government sources external credit for reconstruction and mitigation efforts.</p> <p><i>Additional contingent credit facilities could include:</i></p> <p><i>(i) World Bank Economic Recovery Facility</i></p> <p><i>(ii) CDB Disaster Mitigation Facility</i></p>

³⁶ List of Government Properties for Insurance, Ministry of Finance, Development and Planning, 2001

St. Kitts and Nevis
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self-Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
				<i>the appropriate infrastructure improvement, retrofitting and, in some cases, relocation.</i>		
	Technical					
National Disaster Office		<p>Budgetary allocations are made towards the National Emergency management Agency (NEMA) only for operations. <i>No emergency funds are deployed for contingencies.</i></p> <p>Government has EC\$2.9 millions in a Fiscal Tranche at the Central Bank, which is a contingency fund.³⁷</p> <p><i>NEMA depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>(i) NEMA promotes risk reduction through the national committees, public education and awareness programs, national training programs, literature distribution and media programs.</p> <p><i>NEMA needs to:</i></p> <p><i>(i) embark on a broad based insurance, risk management and disaster preparedness education programme</i></p> <p><i>(ii) emphasize retrofitting, maintenance and building standards and insurance coverage</i></p>			
Business and Industry, Financial	Leaders	<p><i>There is no Advisory Council drawn from the wider society or the productive sector.</i></p> <p><i>The work of NEMA should be broadened to include a Technical Advisory Team drawn from NGOs, banking, insurance, industry and engineering to advise the Insurance Regulator and to promote best practices.</i></p>	<p>Some Insurance companies provide incentives to homeowners such as lower premium rates for risk reduction not for risk assessment and management checks.</p>	<p><i>Public autonomous enterprises under the management of the central government such as Water and Electricity are not adequately insured because of small profit margins and government's fiscal constraints but the government statutory bodies are insured to actual value.</i></p> <p><i>Pooling method would most appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p>Sugar: There is no risk transfer mechanism or self- insurance.</p> <p>The industry is a financial burden and is in transition.</p> <p>Tourism: There is no risk transfer mechanism or self- insurance for locally owned properties.</p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower cost through increased portfolio.</i></p>	<p><i>Alternative risk financing for the business and industry would involve:</i></p> <p><i>(i) Allocation of capital reserve during the profitable years to be used as collateral for debt financing for reconstruction effort.</i></p> <p><i>(ii) Use of capital market instruments to generate raise equity capital for the recovery effort</i></p> <p><i>(iii) Creation of a venture capital fund to supplement recoveries from business interruption insurance.</i></p>

³⁷ ECCB Credit Market Report, Feb 15, 2002

St. Kitts and Nevis
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>Leadership should be provided by the private enterprises that are leaders in financial management; have a history of adequate insurance coverage; adhere to building standards; and enjoy a strong institutional advocacy and goodwill.</i></p>	<p>About 100% of company buildings are insured to actual value because the terms and conditions of the debt capital require building standards are strictly adhered to at all stages of the construction.³⁸</p> <p>About 100% of company buildings are insured against all perils and are built in accordance with building standards</p> <p>About 50% of private firms buy business interruption insurance <i>but these do not cover compensation for employees.</i></p> <p>Insurance companies offer lower rates where prescribed building standards are applied in the construction phase and for retrofit investment.</p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant's first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mrs. Ruth Joseph, Insurance Regulator, Ministry of Finance, Basseterre, St Kitts
 - Mr. Oliver Knight, Director of Planning, Ministry of Finance, Development and Planning, Basseterre, St Kitts
 - Mr. Patrick Williams, Senior Physical Planning Officer, Ministry of Finance, Development and Planning, Basseterre, St Kitts

³⁸ Estimates are based on discussions with the insurance regulator and based on my knowledge of the market.

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

ST. LUCIA

St. Lucia

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
Civil Society (Communities and their organizations)		Under World Bank Project, Red Cross works with local disaster committees to train communities to identify hazards. Completed in 7 communities with 6 remaining. <i>Lack of importance attached to earthquakes.</i>	National consultations held with service and religious groups. Low level of participation in training to identify vulnerability. <i>Due to topography of island, there is much housing in hazard prone areas like hillsides, coastal areas and riverbanks.</i> <i>Much development located in hazard prone areas due to unplanned development and squatting which is still occurring.</i>	Ministry of Works assists some community groups to conduct assessments of physical structures.	<i>Need for local groups to receive environmental training.</i>	Vulnerable groups and facilities identified.
Local Government	Policy		Castries City Council took on some disaster management functions for Castries. Functions as a local disaster committee for food distribution. City Council conducts annual shelter assessments. Invite public to nominate structures to be used as shelters and these are inspected by Ministry of Works to determine suitability.			
	Technical					
Local Disaster Committees		Hazard maps used to identify flood prone areas and inform committees. Committees also pass on local and historical information to NEMA. <i>Committees do not have copies of hazard maps. Must access them at Physical Planning Department.</i> <i>Committee members not trained to interpret maps.</i>		Committees assist in identifying vulnerable structures.		<i>Disaster committees not provided with copies of hazard maps.</i>

St. Lucia

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>	<p>Draft Mitigation Plan prepared but not yet adopted.</p> <p>National Mitigation Council established in 2001 to oversee vulnerability mapping component of World Bank Project. Chaired by Minister of Works.</p> <p>National Emergency Advisory Council set up.</p>	<p>Ministry of Community Development cooperating with Women and Development Unit from UWI Barbados on study of Women's Vulnerability to Social and Natural Disasters in 6 communities in south-east.</p> <p>National consultations held.</p> <p>Vulnerable groups identified.</p>		<p>Environmental systems not well protected.</p>	
	<i>Technical</i>	<p>Landslide (1985) and debris (1995) hazard maps prepared. Landslide map updated 1995. Coastal Hazard map (1980) includes volcano, flooding, storm winds, landslides and earthquake prone areas in coastal zone.</p> <p>Japanese funding available to Ministry of Planning for flood map</p> <p>World Bank Hazard Management Project includes a mapping component, which will review earlier maps. Technical Working Committee will guide how maps will evolve.</p> <p>Maps used by Physical Planning to appraise development applications and in strategic plan preparation. Used by other departments to assist in project planning and routine work.</p> <p>Physical Planning now trying to produce maps more applicable to local planning.</p> <p><i>Most hazard mapping done by external consultants, therefore local expertise may be limited and procedures not institutionalized.</i></p> <p><i>Legends on maps need to be refined to be more useful and to define terms such as 'extreme, high and moderate vulnerability'.</i></p>		<p>Ministry of Works conducted vulnerability exercise for government buildings.</p>		

St. Lucia

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National Disaster Office		Has access to hazard maps NEMO promotes development and use of hazard information across all sectors.	NEMO involved in identifying vulnerable groups. NEMO organizes awareness and vulnerability reduction programmes for some vulnerable groups.	NEMO inspects some facilities as part of hurricane preparedness programme. <i>Vulnerability assessments of structures conducted by Ministry of Works but not forwarded to NEMO. NEMO should have list and participate in regular updates.</i>	NEMO tries to make link between environmental degradation and vulnerability and increase awareness across all sectors.	
Business and Industry	Leaders	During the last 3 years, the Ministry of Tourism with NEMA and Fire Services held 1 day training sessions to sensitize small property owners to hazards. Low attendance. <i>Businesses do not have copies of hazard maps.</i>				
	Members					

St. Lucia

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
<i>Civil Society (Communities and their organizations)</i>		Ministry of Works assists some community groups to carry out remedial work on buildings that were assessed to be in need of repair. NEMO collaborating with the Poverty Reduction Fund (Ministry of Social Transformation) to carry out infrastructure work on self help basis in vulnerable communities. <i>Need for displays of appropriate building techniques.</i>		NEMO in talks with community college and adult education programme to introduce hazard information. CDERA offered modular community-based disaster course to community college and adult education programme. NEMO gives talks to schools when invited. <i>Need more structure approach with Ministry of Education to incorporate hazard information into curricula.</i>		Appropriate building materials available. Communities participate in some damage assessment.
<i>Local Government</i>	<i>Policy</i>					
	<i>Technical</i>					
<i>Local Disaster Committees</i>		NEMO bringing together committees with Poverty Reduction Fund to get advice on preparing project proposals for funding works.		Committees have a type of 'Contingency Plan', which identifies community resources and their owners and vulnerable groups. Plan revised annually. <i>No community mitigation plans in place.</i>		

St. Lucia

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
National						
Central Planning and Sectoral Agencies	Policy	<p>Public buildings conform to standards.</p> <p><i>Infrastructure and other built development located in hazard prone areas.</i></p>	<p>1988 Manual for Developers used to identify criteria for location of development to avoid hazard-prone areas.</p> <p>Manual available to public and familiar to developers and contractors.</p> <p>Also use CUBIC to guide construction.</p> <p>Training at Sir Arthur Lewis Community College includes construction management, building construction and architectural studies.</p> <p>Meteorological Office preparing to set up an Early Warning System.</p> <p>Building Code already drafted <i>but not yet adopted.</i></p> <p><i>Need workshops to sensitize government, public and construction sector on requirements of code.</i></p> <p><i>Hurricane Mitigation techniques not well detailed in existing standards. New building code addresses this deficiency.</i></p> <p><i>Existing Manual for Developers focuses on land use criteria and layouts. It is not construction-oriented.</i></p> <p><i>No flood markers erected.</i></p>	<p>OECS Solid Waste project identified deficiencies in waste disposal that increase vulnerability.</p>	<p>Sustainable Development Committee comprises NEMA, Solid Waste, Agriculture Lands and Fisheries; and National Conservation Council.</p> <p>EIAs requested under previous planning legislation but are now a requirement under new Act.</p> <p>High degree of compliance from developers for EIA.</p> <p>EIAs reviewed by many agencies who may also be involved in preparing TOR for EIA.</p> <p>Agencies responsible for protecting environmental systems included in review of development proposals and identify potential impacts and mitigation measures needed.</p> <p><i>EIAs circulated for comment on sectoral basis. Comprehensive EIA not sent to individual agencies/sectors.</i></p> <p><i>NEMO Act #13 of 2000 and Disaster Emergency Response Act require EIAs be copied to NEMO. EIAs not circulated to NEMO.</i></p> <p><i>No hazard assessment required as part of project appraisal.</i></p> <p><i>Some legislation to protect environmental systems not adequately enforced due to lack of resources and suitably qualified staff.</i></p> <p><i>There is no Department of the Environment and no umbrella environmental legislation.</i></p> <p><i>Agriculture and forestry practices, built development and squatting contribute to environmental degradation.</i></p>	<p>National response Plan previously prepared and adopted. Now under review.</p> <p>Some government incentives offered for post disaster recovery efforts.</p> <p>Post disaster measures tied to donor agencies and usually for capital works such as building sea walls, strengthening retaining walls and rebuilding structures.</p>

St. Lucia

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>	Staff familiar with development standards.	World Bank Project includes training of shelter managers, reinforcing channel of river near Hewanorra to reduce flooding. <i>Lack of inspectors and resources for monitoring.</i>	Business Continuity Plans prepared by Prison, Port Authority, Hospital and Ministry of Works.		Ministries of Works, Tourism and Agriculture do damage assessments. Combined report (if individual reports received within 48 hours) submitted to Chairman of National Damage Assessment Committee. Cultural sector recently included. <i>Need to include churches in preparing assessments for inclusion in National Damage Assessment Report.</i>
<i>National Disaster Office</i>		NEMO arranges funds for repair of some private buildings used as shelters.	NEMO produces "Be Safe" leaflets advising persons of actions to take in event of hazard. Some information also reproduced from NEMA in Trinidad. Funding from German government via OECS to produce flyers. NEMO has good working relationship with media and carries out much public awareness and education work.			Matrix of hazard events that occurred in St. Lucia, includes event, number of people dead and cost of damage. Post Disaster Damage Assessment Team includes private sector engineers and quantity surveyors.

St. Lucia

Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Business and Industry	Leadership			<p>Cable and Wireless has Business Continuity Planner and Standard Operating Procedures, which are regularly updated and reviewed by NEMA.</p> <p>Business Continuity Plans being finalized for tourism sector with contributions from heritage tourism sub-sector and their property owners.</p> <p>Caribbean Tourism Organization has hurricane plan, which advises hotels of actions to take during a hazard event.</p> <p>LUCELEC has hurricane plan.</p> <p><i>Businesses not identifying what actions they need to take to ensure their corporate sustainability in event of a hazard event.</i></p> <p><i>Hotel and tourism sector not advised on what to do in event of hazard other than a hurricane.</i></p>		
	Members		<p>NEMWIL and British American Insurance companies offer premium reductions if houses incorporate disaster reduction measures.</p> <p><i>Insurance companies reluctant to insure wooden buildings.</i></p>		<p>Bank of St. Lucia has a recovery plan that commits them to be ready to conduct business within 6 hours of an all clear signal from NEMO after a hazard event.</p> <p>Many businesses only doing regular building maintenance work, sandbagging during hurricanes.</p> <p>Appropriate building materials available.</p> <p><i>Businesses not conducting structural assessments of their buildings.</i></p>	

St. Lucia

Table 3: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society (Communities and their organizations)		<p><i>NGOs are not involved in risk transfer.</i></p> <p><i>There is no alternatives to insurance be it contingency credit or contingency equity.</i></p> <p>Friendly Societies operate a "loose" form of self-insurance for their parishioners through informal welfare schemes.</p> <p>Some churches build up contingency funds for providential purposes.</p> <p><i>NGOs are not involved in housing or property development.</i></p>	<p><i>There is no group insurance for homeowners. Homeowners and investors depend entirely on the property insurance market, which, although some carriers cannot buy adequate reinsurance.</i></p> <p>Most properties in the middle and upper income groups are comprehensively insured to actual value as this forms part of the mortgage agreement.</p> <p><i>A significant percentage of properties in the lower income group are under-insured or are not insured because of the high deductible on catastrophe insurance, high premium rates and the relatively long period without a major catastrophe.</i></p> <p><i>Many of the properties in the lower income group are uninsurable due to building standards, type of material used and vulnerability – low-lying areas, on precipitous areas.</i></p> <p><i>Unlike the motor insurance industry, there is no compulsory insurance for private properties.</i></p> <p><i>Given St Lucia's vulnerability to hurricane and volcanic actions, there is a critical need for compulsory insurance for properties.</i></p>			<p><i>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</i></p> <p>Commercial properties, particularly, hotels that are part of international chains, may be using risk financing options that allow multi-year coverage that would result in stabilizing premiums.</p>
Local government	Policy	[There is no local government body. All activities are prosecuted by a national agency.]				
	Technical					
Local Disaster Committees						

St. Lucia

Table 3: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<p><i>Government does not allocate contingency funds in its annual budget based on actuarial probabilities.</i></p> <p>However a Contingency Fund EC\$1.6 million and a Capital Contingency Fund of EC\$ 1.1 million are available as part of the risk transfers policy.³⁹</p> <p><i>Government will be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p>The insurance regulatory function is relatively developed <i>but inadequate for the demands of the market.</i></p> <p>The office is fairly staffed and equipped but the staff has limited technical skill in risk management.</p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department. <i>However there are no hazard maps governing insurer's levels of catastrophe peril liabilities, no functional linkage between the physical planning and the insurance regulation, and very little enforcement.</i></p> <p><i>The insurance regulator needs to:</i></p> <p>(i) <i>Have the capacity to do catastrophe premium pricing.</i></p> <p>(ii) <i>Educate with respect to reducing the financial impact of events and; minimizing the probability of avoidable losses.</i></p>	<p><i>Government has no policy for insuring public assets. Only certain assets are insured.</i></p> <p>The public properties, which are insured, are covered under the specific loan conditions and lease arrangement.</p> <p>EC\$500,000 are allocated annually for premium payments.⁴⁰</p> <p><i>There is no public fund or mechanism established to indemnify the poor or to provide incentive for undertaking mitigation measures.</i></p> <p><i>Government needs to explore the feasibility of</i></p> <p>(i) <i>Investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</i></p> <p>(ii) <i>Providing incentives for catastrophe risk coverage for low-income groups particularly those occupying areas prone to landslide such as squatters.</i></p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • Government Headquarters • The Parliament Building • The Graham Louisy Administration Building • The National Cricket Ground <p><i>NB: All other public assets are not insured.</i></p>	<p>Government sources external credit for reconstruction and mitigation efforts.</p> <p><i>Additional contingent credit facilities could include:</i></p> <p>(i) <i>World Bank Economic Recovery Facility</i></p> <p>(ii) <i>CDB Disaster Mitigation Facility</i></p>
	Technical					

³⁹ Comptroller of Budget, Ministry of Finance

⁴⁰ Comptroller of Budget, Ministry of Finance

St. Lucia

Table 3: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National Disaster Office		<p>Budgetary allocations are made towards the National Emergency Management Office (NEMO) only for operations. <i>No emergency funds are deployed for contingencies.</i></p> <p><i>NEMO depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>NEMO promotes risk reduction through the national committees, public education and awareness programs throughout the year but is more active during the hurricane season.</p> <p><i>NEMO needs to:</i> (i) <i>embark on a broad based insurance, risk management and disaster preparedness education programme</i> (ii) <i>emphasize retrofitting, maintenance and building standards and insurance coverage</i></p>			
Business and Industry, Financial	Leaders	<p><i>There is no society-wide Advisory Council but local Focal Points are very active in education and awareness programmes.</i></p> <p><i>The work of NEMO must be broadened to include a Technical Advisory Team drawn from NGOs, banking, insurance, industry and engineering to advise the Insurance Regulator and to promote best practices.</i></p> <p>The National Development Foundation has organized safer building training, a home retrofit loan program and a group insurance program for lower income homeowners.</p>	<p>Some insurance companies provide incentives (to homeowners) such as lower premium rates for risk reduction not for risk assessment and management checks.</p>	<p>Public autonomous enterprises under the management of the central government such as Water and Electricity are insured to actual value.</p> <p>All statutory bodies such as the port are insured to actual value.</p> <p><i>Pooling method would most be appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p>	<p>Banana Industry: The Windward Island Crop Insurance (WINCROP) provides a measure of protection for windstorm damage, but <i>there is no risk transfer mechanism or self-insurance. Reserving is however never sufficient to bail out the industry in difficult periods.</i></p> <p>Tourism: <i>There is no risk transfer mechanism or self-insurance for locally owned properties.</i></p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower cost through increased portfolio.</i></p>	<p><i>Alternative risk financing for the business and industry would involve:</i> (i) <i>Allocation of capital reserve during the profitable years to be used as collateral for debt financing for reconstruction effort.</i> (ii) <i>Use of capital market instruments to generate raise equity capital for the recovery effort</i> (iii) <i>Creation of a venture capital fund to supplement recoveries from business interruption insurance.</i></p>

St. Lucia

Table 3: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>The insurance companies should provide the leadership, as they are the private enterprises that are the leaders in risk management initiatives.</i></p>	<p>All company buildings built from loan funds are insured to actual value because the terms and conditions of the debt capital require that building standards are strictly adhered to at all stages of the construction.</p> <p>All those company buildings are insured against all perils and are built in accordance with building standards</p> <p>In most cases, commercial properties are insured to their actual value to meet the conditionalities of the loans and overdraft facilities.</p> <p>Some commercial properties are insured against business interruption.</p> <p><i>Private firms do not cover compensation for employees.</i></p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p> <p><i>There is need for more forward planning by the private sector.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant's first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mrs. Judith Joe, Supervisor of Insurance, Ministry and Planning, Castries.
 - Mr. Reginald Darius, Director of Finance, Ministry of Finance and Planning, Castries.
 - Mr. Phillip Dalsou, Comptroller of Budget, Ministry of Finance and Planning, Castries.

**Natural Hazard Risk Management in the Caribbean
Actual Practices and Gaps**

ST. VINCENT AND THE GRENADINES

St. Vincent and the Grenadines

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
Local						
<i>Civil Society (Communities and their organizations)</i>		Some population groups aware of local hazards based on historical events. <i>Need to increase awareness of flooding and landslides.</i>	Population groups in some areas aware of their vulnerability, eg in areas affected by 1979 volcanic eruption. Scheduled 1-week programme in May 2002 to increase awareness in areas vulnerable to volcanic activity. National Emergency Organization seeking assistance from CDERA to train communities in areas prone to coastal flooding to assess their vulnerability. <i>Need to increase awareness among populations in areas vulnerable to landslides and flooding.</i> <i>Due to topography of island there is some development in hazard-prone areas.</i>	<i>No comprehensive structural vulnerability assessments carried out.</i>		
<i>Local Government</i>	<i>Policy</i>					
	<i>Technical</i>					
<i>Local Disaster Committees</i>			Disseminate information about vulnerability to villages, appropriate preparedness measures and response activities. Assisted by health groups, which are part of committee. Maintain list of shelters. Committees identify vulnerable groups.	Assess condition of shelters as part of hurricane preparedness programme.		

St. Vincent and the Grenadines

Table 1: Risk Identification – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
			Socio-economic	Physical	Environmental	
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>	National Mitigation Council to be established in 2002.				
	<i>Technical</i>	Central Planning Division has GIS capacity and prepares rudimentary, generalized hazard maps. <i>No mapping of areas vulnerable to landslides, such as Marriaqua Valley.</i> <i>No mapping of storm surge from hurricanes.</i>	Vulnerability reduction measures carried out on shelters by Ministry of Transport and Works.	Some utility companies (eg VIN-LEC and central Water and Sewerage Authority) keep list of critical facilities which may be vulnerable to hurricanes.		
<i>National Disaster Office</i>					<i>No link established between hazards and environmental management. NEO focuses on Response and Preparedness.</i>	
<i>Business and Industry</i>	<i>Leaders</i>	<i>Insurance industry not very responsive to hazard issues.</i>				
	<i>Members</i>			Cable and Wireless has list of critical facilities which may be vulnerable to hurricanes.		

St. Vincent and the Grenadines
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
Local						
<i>Civil Society</i> <i>(Communities and their organizations)</i>			<i>Populations in areas vulnerable to floods and landslides not very aware of their vulnerability.</i>			
<i>Local Government</i>	<i>Policy</i>					
	<i>Technical</i>					
<i>Local Disaster Committees</i>			<i>Outside the hurricane season, committees disseminate some information about mitigation measures and retrofitting techniques.</i>	<i>Health groups on some local disaster committees have contingency plans.</i>		
National						
<i>Central Planning and Sectoral Agencies</i>	<i>Policy</i>		<p>Planning Regulations include development standards, which are used as the basis for approving development applications.</p> <p>Draft Building Code now in preparation, in collaboration with stakeholders such as architects, engineers and builders.</p> <p>Some zoning work on-going at Physical Planning Division to guide development away from hazard-prone areas or articulate standards for development.</p> <p>Draft National Physical Development Plan was prepared and submitted to Cabinet.</p> <p><i>Draft National Physical Development Plan not yet approved or adopted.</i></p>	<p>Utility companies, health sector and airport have disaster plans and recovery plans.</p>	<p>Ministry of Health and Environment has policies and legislation to protect mangrove, beaches and marine life.</p> <p>EIAs requested as part of development approval process but on ad hoc basis. <i>EIAs not institutionalized and not provided for in existing legislation. Hazard information not a standard part of EIA request.</i></p> <p><i>Environmental systems not well protected by policies or legislation.</i></p> <p><i>No links made between environmental degradation and natural hazards.</i></p>	

St. Vincent and the Grenadines
Table 2: Risk Reduction – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
		Structural	Non-Structural			
	<i>Technical</i>		<p>Flood Mitigation project funded by Japanese about to be implemented in Marriagua Valley. Will include flood maps.</p> <p>Mitigation measures taken by utilities to protect their critical facilities and take action to restore them to service if affected by hazard event.</p> <p>Major agencies represented on National Advisory Council, which is the highest decision making body for disaster management in St. Vincent.</p> <p><i>Central Planning Division not adequately staffed with Inspectors to monitor development and enforce regulations. Also not well staffed with planners to prepare land use policies to guide location of development.</i></p>			
<i>National Disaster Office</i>			<p>NEO conducts public awareness campaigns at start of hurricane season to disseminate information about mitigation and retrofitting techniques.</p>			
<i>Business and Industry</i>	<i>Leadership</i>			<p>Caribbean Tourism Association recently prepared a Hurricane Preparedness Manual for hotels. All hotels have copies and are expected to use it.</p>		
	<i>Members</i>			<p>Carenage Bay Hotel has disaster plan.</p>		

St. Vincent and the Grenadines
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Local						
Civil Society (Communities and their organizations)		<p>NGOs are not involved in risk transfer.</p> <p>There are no alternatives to insurance, either contingency credit or contingency equity.</p> <p>A few churches operate a “loose” form of self-insurance for their parishioners through informal welfare schemes</p> <p>Some churches build up contingency funds for providential purposes through the establishment of “Friendly Societies.”</p> <p>NGOs are not involved in housing or property development.</p>	<p>There is no group insurance for homeowners. Homeowners and investors depend entirely on the property insurance market.</p> <p>Most properties in the middle and upper income groups are comprehensively property insurance to actual value as full insurance coverage forms part of the mortgage agreement.</p> <p>A significant percentage of the housing stock in the lower income group is under-insured or has no insurance coverage as result of income loss, poor education, and a general disposition to make no provisions for insurance of property.⁴¹</p> <p>Some properties are uninsurable due to building standards, type of material used and vulnerability – low-lying areas, on precipitous areas.</p> <p>Unlike the motor insurance industry, there is no compulsory insurance for private properties.</p> <p>Given the islands’ vulnerability to volcanic actions, there is need for compulsory insurance for properties.</p>			<p>There is no risk financing mechanism that allows losses to be paid off in the future through credit facility.</p> <p>Commercial properties, particularly, hotels that are part of international chains, may be using risk financing options that allow multi-year coverage that would result in stabilizing premiums.</p>
Local government	Policy	[There is no local government body. All activities are prosecuted by a national agency.]				
	Technical					
Local Disaster Committees						

⁴¹ Like its neighbour, Grenada, the islands were last affected by a hurricane in 1955.

St. Vincent and the Grenadines
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National						
Central Planning and Sectoral Agencies	Policy	<p><i>Government does not allocate contingency funds in its annual budget based on actuarial probabilities</i></p> <p><i>NB: The absence of deliberate risk transfer policy may be partly due to the fact that the country has not had a major disaster (fire, volcanic and hurricane) recently, although it is often moderately affected by windstorms during the hurricane season.</i></p> <p>Government will be expected to encourage tax incentives when the Catastrophe Pool is established under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</p>	<p><i>The insurance regulatory function is inadequate. The office is poorly staffed but is equipped with a fair amount of technical skill. Skills in risk management are limited.</i></p> <p>Some aspects of planning, zoning and hazard mapping (hazard mapping for flooding and landslides) are being done by the Physical Planning Department. However there are no hazard maps governing insurer's levels of catastrophe peril liabilities, no functional linkage between physical planning and the insurance regulation, and very little enforcement.</p> <p><i>The insurance regulator needs to:</i></p> <p>(i) <i>Have the capacity to do catastrophe premium pricing.</i></p> <p>(ii) <i>Educate with respect to reducing the financial impact of events and minimizing the probability of avoidable losses.</i></p>	<p><i>Government has no policy for insuring public assets. Most public assets are uninsured.</i></p> <p>The public properties, which are insured, are covered under the specific loan conditions and lease arrangement.⁴²</p> <p><i>There is no public fund or mechanism established to indemnify the poor or to provide incentive for undertaking mitigation measures.</i></p> <p><i>Government needs to explore the feasibility of</i></p> <p>(i) <i>Investing in contingency credit and contingency equity to increase liquidity for rehabilitating damaged buildings, schools, hospitals, water facilities, ports, roads bridges using credit and capital market instruments.</i></p> <p>(ii) <i>Providing incentives for catastrophe risk coverage for low-income groups particularly those occupying areas prone to landslide such as squatters.</i></p>	<p>The public assets which are insured include:</p> <ul style="list-style-type: none"> • Government Headquarters • The Fisheries Complex • The Arnos Vale Playing Field • The National Stadium <p><i>NB: All other public assets are not insured.</i></p>	<p>Government sources external credit for reconstruction and mitigation efforts.</p> <p><i>Additional contingent credit facilities could include:</i></p> <p>(i) <i>World Bank Economic Recovery Facility</i></p> <p>(ii) <i>CDB Disaster Mitigation Facility</i></p>
	Technical					

⁴² Annual budgetary premium for the Government Headquarters is about EC\$200, 000 according Mr. Isaac Solomon, Budget Director, Ministry of Finance and Planning

St. Vincent and the Grenadines
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget/Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
National Disaster Office		<p>Budgetary allocations are made towards the National Disaster Preparedness Committee (NDPC) only for operations. No emergency funds are deployed for contingencies.</p> <p>Government has ECS\$3.5 millions in a Fiscal Tranche at the Central Bank, which is a contingency fund.⁴³</p> <p><i>NDPC depends largely on inflows from regional and international donors in the aftermath of a disaster.</i></p>	<p>NDPC promotes risk reduction through the national committees, public education and awareness programs mainly during the hurricane season.</p> <p><i>NDPC needs to:</i></p> <p><i>(i) embark on a broad based insurance, risk management and disaster preparedness education programme</i></p> <p><i>(ii) emphasize retrofitting, maintenance and building standards and insurance coverage</i></p>			
Business and Industry, Financial	Leaders	<p><i>There is no society-wide Advisory Council.</i></p> <p><i>The work of NDOC must be broadened to include a Technical Advisory Team drawn from NGOs, banking, insurance, industry and engineering to advise the Insurance Regulator and to promote best practices.</i></p>	<p><i>Insurance companies do not provide incentives to homeowners such as lower premium rates for risk reduction or for risk assessment and management checks.</i></p>	<p><i>Public autonomous enterprises under the management of the central government such as Water and Electricity are not adequately insured because of general mood in the insurance market.</i></p> <p><i>Statutory bodies such as the port are insured to actual value.</i></p> <p><i>Pooling method would most be appropriate for these enterprises. These are to be covered under The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project</i></p>	<p>Banana Industry: The Windward Island Crop Insurance (WINCROP) provides a measure of protection for windstorm damage, <i>but there is no risk transfer mechanism or self-insurance.</i></p> <p>Tourism: <i>There is no risk transfer mechanism or self-insurance for locally owned properties.</i></p> <p><i>Joint purchase of insurance coverage is an imperative (given the similar exposure) to lower cost through increased portfolio.</i></p>	<p><i>Alternative risk financing for the business and industry would involve:</i></p> <p><i>(i) Allocation of capital reserve during the profitable years to be used as collateral for debt financing for reconstruction effort.</i></p> <p><i>(ii) Use of capital market instruments to generate raise equity capital for the recovery effort</i></p> <p><i>(iii) Creation of a venture capital fund to supplement recoveries from business interruption insurance.</i></p>

⁴³ ECCB Credit Market Report, Feb 15, 2002

St. Vincent and the Grenadines

Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

		Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
	<i>Members</i>	<p><i>Leadership should be provided by the private enterprises that are leaders in financial management particularly the insurance sector.</i></p>	<p>A high percentage of company buildings are insured to actual value because the terms and conditions of the debt capital require building standards are strictly adhered to at all stages of the construction.</p> <p><i>Most company buildings are not insured against all perils.</i></p> <p><i>No coverage is taken for business interruption, given the low incidence of major catastrophes.⁴⁴</i></p> <p><i>Private firms do not cover compensation for employees.</i></p> <p><i>There is need for legislation to enforce the insurance of private property.</i></p> <p><i>There is need for more forward planning by the private sector.</i></p>			

References

The information on risk transfer practices is the product of:

- (1) The consultant first hand knowledge of the OECS insurance market, having being involved in market development since 1991.
- (2) Research on the insurance market, government planning and macro-economic policies, sub-regional disaster agencies, the private sector and NGOs in mitigation efforts.
- (3) Discussions with market players in insurance, regulation, planning, and disaster mitigation including:
 - Mr. Isaac Solomon, Budget Director, Ministry of Finance and Planning

⁴⁴ Like its neighbour, Grenada, Hurricane Janet hit St Vincent and the Grenadines in 1955.

OECS AND CARICOM

OECS and CARICOM
Table 1: Risk Identification – Actual Practices

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
Subregional					
<i>OECS Framework</i>	<p><i>Detailed hazard maps not yet prepared for some countries.</i></p> <p><i>Inadequate distribution of hazard maps at the community level.</i></p> <p><i>Need to produce hazard maps that can be easily understood and interpreted at the community level.</i></p>	<p>GTZ Decentralized Disaster Project provides for developing a series of communication systems for risk forecasting in St. Kitts/Nevis, Dominica and St. Lucia where they will target poorer communities affected by Tropical Storm Debby.</p>	<p><i>Lack of comprehensive institutional approach to carrying out vulnerability assessments and inadequate of coordination and communication between agencies at national level.</i></p>	<p>The practice of integrating disaster management initiatives with environmental priorities is stated in Principle 9 of the St. Georges Declaration of Principles for Environmental Sustainability in the OECS.</p> <p>Member of staff of NRMU training in Environmental Auditing.</p>	<p>OECS/NRMU preparing a Manual and Guidelines on Post Disaster Rapid Environmental Assessment for use in OECS to identify environmental risks following a disaster and inform response decisions. Will include assessment of OECS-wide response to Hurricane Lenny and case studies of Antigua and St. Vincent.</p> <p>Includes participation from OAS, IDB, CIDA, USAID, Trinidad and Jamaica.</p> <p>Technical Manual and Guidelines to be prepared by June 2002 followed by workshops and training to introduce</p> <p><i>Insufficient use of Environmental Management Systems by companies in OECS to identify hazard risks and develop strategies to reduce risks outputs.</i></p>
<i>Inter-Country Collaboration</i>					
Regional					
<i>Regional Institutions</i>	<p>CDERA collaborated with the Japanese to assess the capacity of countries to do hazard mapping and vulnerability assessments. Caricom-Japanese Cooperative Agreement will strengthen these capacities, including GIS component.</p> <p>Focus on flood hazard in 3 pilot countries - Barbados, St. Vincent and Trinidad.</p> <p>OAS/CDMP⁴⁵ documented hazard mapping availability in the region as on output of the 1999 CDMP Hazard Mapping and Vulnerability Assessment Workshop which also provided an overview of assessment techniques used in region.</p>	<p>Under DIPECHO Project communities in St. Lucia, Dominica, Bahamas and Barbados taught skills to prepare for hazards. Methodology and training materials made available to other countries.</p> <p>World Bank US \$37 million project: part of funds used to enhance community disaster planning.</p> <p>USAID Disaster Management Training Programme provided training for Instructors in damage assessment and needs analysis. Focus on communities at risk.</p> <p>Community level vulnerability assessments done in Dominican Republic and Haiti under CDMP</p>	<p>Vulnerability audits for critical facilities focused on schools under CDMP.</p> <p>Sectoral vulnerability assessments conducted under CDMP for Caribbean Electrical Utilities; for schools and shelters in the Eastern Caribbean; vulnerability audit for hydroelectric power facilities in Dominica, electrical power facilities in St. Lucia and transmission and distribution facilities in St. Vincent.</p> <p>Structural vulnerability assessments carried out for selected government facilities in Antigua/Barbuda and St. Kitts/Nevis under Post-Georges Disaster Mitigation project.</p>		<p>CDMP Storm hazard modeling assesses the risk to coastal areas from tropical storm surge and associated high winds. TAOS model installed at the CIMH and staff trained to apply model to member countries. Applied at Parham Harbour in Antigua (1995); west coast of Dominica; Montego Bay (1997), Kingston. Regional atlases also developed.</p>

⁴⁵ Caribbean Disaster Mitigation Project, www.oas.org/cdmp

OECS and CARICOM
Table 1: Risk Identification – Actual Practices

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Hazard Assessment and Mapping	Vulnerability Assessment			Risk Assessment
		Socio-economic	Physical	Environmental	
	<p>As part of the CDMP, sub-regional seismic hazard maps prepared for the Leeward Islands, Windward Islands and Jamaica by UWI Seismic Research Unit, assessments of landslide and earthquake hazards conducted in Jamaica and river flooding in Belize.</p> <p>Storm surge atlas prepared for the Eastern Caribbean by CIMH under the CDMP.</p> <p>PGDM produced hazard maps and vulnerability assessments for Antigua/Barbuda and St. Kitts/Nevis.</p> <p>Communities trained to identify hazards under USAID community preparedness programme.</p> <p>CDMP provided for physical planners and disaster coordinators to review hazard maps and on use of maps for vulnerability assessments and incorporation into development planning and control and environmental management.</p>	Republic and Haiti under CDMP	Disaster Mitigation project		
<i>Multilateral Lending Institutions, Bilateral Donors</i>	CDB to use Disaster Mitigation Facility for the Caribbean (DMFC) to further hazard mapping and integrate into the development planning process				

OECS and CARICOM
Table 2: Risk Reduction – Actual Practices

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
Subregional					
OECS Framework		<p>OECS Secretariat prepared model building code which is being customized by some member countries.</p> <p>OECS Secretariat offers technical guidance to governments, sources technical expertise for EIAs and acts as a reviewer for terms of reference for EIAs.</p> <p><i>Need to ensure that all countries have resources to customize building codes or develop national codes.</i></p> <p><i>Lack of technical and financial resources for monitoring of development and enforcement of codes</i></p> <p><i>Need for institutional strengthening of physical planning departments and national disaster offices in some countries.</i></p> <p><i>Absence of a well-defined mechanism and procedure for integrating existing hazard information into the land-use planning process.</i></p>	<p>GTZ disaster project includes development of community emergency plans in rural communities in Nevis (pilot), St. Kitts, St. Lucia and Dominica. Draft Plans for St. Kitts, Dominica and St. Lucia under final review</p> <p>NRMU Watershed Project in St. Lucia, St. Vincent and St. Kitts introduces community based technologies such as river bank stabilization and addresses erosion, environmental degradation, water quality and appropriate watershed uses. Project also includes training in application of bio-engineering techniques and use of indigenous food crops.</p> <p>NRMU's Environmental Capacity Development Project also includes development of curriculum materials for teaching at community and vocational colleges in the region. Post Disaster Rapid Environmental Assessment project will also develop curriculum materials and teaching aids.</p> <p>OECS Education Reform Project includes Technical and Vocational Education and Training with links to the education system.</p> <p><i>Need to develop link between the insurance industry and environmental hazards.</i></p>	<p>St. Georges Declaration (OECS Environmental Charter) not binding on governments. It is prescriptive and is to be reviewed after 3 years to determine if should become a binding Treaty.</p> <p>OECS/NRMU prepared National Environmental Management Strategy for Anguilla and scheduled to prepare for Dominica (ongoing), St. Vincent and Montserrat. Legislative and Institutional capacity reviews in St. Lucia and St. Kitts will likely result in preparation of EMS.</p> <p><i>EIAs not well institutionalized. Needed for public as well as private sector projects. Need commitment at political level to act on and implement findings of EIA. Need for legislation to support EIA in all countries.</i></p> <p><i>Lack of technical and financial resources and equipment in agencies for monitoring and enforcement of actions requested following EIA.</i></p> <p><i>Institutional and legislative frameworks for addressing wider environmental issues is inadequate.</i></p> <p><i>Inadequate solid waste management and failure to establish clear link between improper garbage disposal and flooding or damage from items which become missiles during hurricane winds and environmental health issues.</i></p> <p><i>Insufficient attention in OECS to Environmental Management Systems (EMS) by companies to monitor their environmental</i></p>	

OECS and CARICOM
Table 2: Risk Reduction – Actual Practices

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
				<i>performance.</i> <i>Need to review legislative and institutional capacities re National Environmental Management Strategies.</i>	
<i>Inter-Country Collaboration</i>					
Regional					
<i>Regional Institutions</i>	<p>Hurricane Resistant Home Improvement Programme: Toolkit prepared under CDMP to address the informal sector.</p> <p><i>Regional initiatives focus on policy measures rather than structural/construction initiatives.</i></p>	<p>Regional Building Code to be updated in 'CUBIC 2000.'</p> <p>Assistance provided to Dominica, Antigua/Barbuda, Grenada and Belize to develop national building codes under CDMP, in collaboration with UNCHS.</p> <p>CDERA conducted series of workshops in Grenada and St. Lucia to integrate disaster management into the planning process. Comprehensive Disaster Management Strategy also seeks to do same with focus on institutional strengthening; incorporating disaster management into projects; public education and training; contingency and hazard specific plans and operational procedures and conducting research to inform public education. Strategy endorsed by OECS and CARICOM. Planned national consultations to get member countries to adopt.</p> <p>Under PGDM, status of building codes in a number of countries documented.</p> <p>Flood Alert and Warning Systems provided in vulnerable communities in Jamaica, Trinidad, Dominican Republic and Haiti under USAID community preparedness programme.</p> <p>Public Facility Inspectors Workshop held in Trinidad in 1999 provided</p>	<p>DIPECHO project developed public education materials and worked with schools to infuse into curricula.</p> <p>Working with CXC to introduce disaster management into syllabus.</p> <p>Discussions with UWI in 1999 to inventory training initiatives at the regional level and coordinate them.</p> <p>1996 CDERA project with UWI Faculty of Law to develop Model Disaster Legislation. Sought endorsement via series of national consultations. Now enacted in Belize and Montserrat and in advanced stage in other countries.</p> <p>DIPECHPO Project hosted regional workshop in St. Lucia in 1999 on vulnerability reduction for school facilities to include issues of school safety, construction and hazard resistance. Developed mitigation policy guidelines.</p> <p>DIPECHO Project producing videos on disaster preparedness for 7 to 11 year olds and interactive class materials for secondary school students to strengthen geography and</p>	<p><i>Focus of initiatives on policy and education rather than capital works.</i></p>	<p>CDERA documented best practices in the recovery efforts in Antigua and St. Kitts after Hurricane Lenny.</p> <p>CDERA prepared Post Impact Situation Reports for various tropical storms, hurricanes, droughts and volcanic eruptions affecting the region since 1997.</p> <p>CDMP documented case study of the effects of Hurricane Luis on the Antigua Public Utility Authority.</p>

OECS and CARICOM
Table 2: Risk Reduction – Actual Practices

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Physical Measures		Socio-economic Measures	Environmental Measures	Post-disaster Measures
	Structural	Non-Structural			
		<p>training to inspect public facilities for compliance with safety standards.</p> <p>Development of comprehensive hazard mitigation policies and plans underway or complete in Jamaica, St. Lucia, Barbados, BVI and USVI.</p> <p>Natural Hazard Mitigation Policy and Plan prepared for Antigua and St. Kitts (PGDM).</p> <p><i>Need to develop model mitigation policies and guidelines.</i></p> <p><i>Lack of enforcement mechanisms to implement building codes.</i></p> <p><i>Need for on-going research to develop appropriate mitigation tools.</i></p> <p><i>Absence of a well defined mechanism and procedure for integrating existing hazard information into the land-use planning process.</i></p>	<p>social science syllabus</p> <p>Post event diagnostic surveys of infrastructure projects resulted in preparation of guidelines on mitigation criteria for infrastructure design.</p>		
<p><i>Multilateral Lending Institutions, Bilateral Donors</i></p>	<p>CDB funding rehabilitation of 9 schools in St. Kitts and retrofitting of shelters in Nevis.</p> <p>World Bank Eastern Caribbean Emergency Management Loans funding structural works in participating countries, as identified in loan assessments.</p>	<p>CDB provides assistance for institutional strengthening of National Disaster Offices and CDERA.</p> <p>CDB assists in promoting better building practices.</p> <p>CDB will provide assistance to BMCs to develop country Building Codes or ensure that existing ones are taken through the legislative process.</p> <p>World Bank Eastern Caribbean Emergency Management Loans supporting institutional strengthening measures in participating countries.</p>	<p>CDB assisting countries to develop Disaster Mitigation Plans and policies and building awareness at the community level.</p> <p>CDB provides assistance to tertiary institutions in the region to facilitate integration of disaster management into their curricula.</p> <p>CDB including mitigation criteria in infrastructure design to ensure long term viability of loan projects.</p>	<p>CDB strengthening its own capacity for mitigation and encouraging borrowing member countries to integrate disaster mitigation measures into all development projects. Also training the Bank's staff in disaster management and designing a strategy for integrating it into the project cycle.</p> <p>CDB developing guidelines for preparing Natural Hazard Impact Assessments (NHIA) which will be funded by the Bank's DMFC and will eventually become part of the project evaluation process. Loan requests for projects will be required to include NHIA.</p>	

OECS and CARICOM
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Subregional					
<i>OECS Framework</i>	<p><i>There is no common insurance legislation in force in the sub-region.</i></p> <p>NB: The insurance legislations in force were enacted between 1967 and 1977. Only St Lucia and Grenada have a modified Caribbean Law Institute (CLI) version and the Trinidad and Tobago version, respectively.</p> <p><i>The respective legislations do not promote risk retention and self-sufficiency to prevent over leveraging of reinsurance and price volatility. The provisions for reserving are purely for the purpose of capitalization.</i></p>				
<i>Inter-Country Collaboration</i>		<p><i>There is no deliberate policy move to consolidate insurance operations across countries.</i></p> <p>NB: Consolidation of the life insurance industry was purely driven by acquisitions.⁴⁶</p> <p><i>The property insurance industry is very inefficient. There are more than 60 insurance entities operating in a market with 500,000 persons.</i></p> <p><i>Minimum standards of operations as set out by a new OECS harmonized insurance legislation should drive the consolidation process.</i></p> <p><i>This is critical as many property insurance companies are under-capitalized and cannot purchase reinsurance coverage because of portfolio size.</i></p>	<p><i>There is no insurance arrangement for public asset coverage.</i></p> <p><i>The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project will provide that facility.</i></p>	<p><i>There is no insurance arrangement for public asset coverage.</i></p> <p><i>The World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project will provide that facility.</i></p>	<p><i>The practice of using contingency credit as supplementary instrument to market reinsurance to reduce price volatility is not established in the OECS countries.</i></p> <p><i>NB: The securities market is embryonic and fiscal difficulties place limit on such initiatives.</i></p> <p><i>Governments and the private sector should:</i></p> <p><i>(i) use capital market instruments to generate equity capital for the recovery effort and</i></p> <p><i>(ii) establish a venture capital fund to supplement recoveries from business interruption insurance.</i></p>

⁴⁶ Colonial Life Insurance Company (CLICO) acquired Capital Life and British American Insurance.

OECS and CARICOM
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
Regional					
<i>Regional Institutions</i>	<p>Funding from CDB has been utilized mainly for the financing of economic infrastructure such as roads, seaports and utilities; as well as post-disaster financing.</p>	<p>Caribbean Association of Insurance Regulators (CAIR) was established to develop harmonized risk classification for the region, <i>but financial difficulties have rendered the body very ineffective. It pays more attention to regulatory issues.</i></p> <p>The Insurance Association of the Caribbean (IAC) promotes harmonization of insurance legislation in collaboration with the CLI and CAIR but <i>except in some jurisdictions (Trinidad, Barbados and Jamaica), the impact on government and private sector policy is limited.</i></p> <p><i>In some jurisdictions, rating agencies evaluate the fiscal health of insurance companies but this is not a normal practice in the OECS.</i></p> <p><i>The regional body for Insurance regulators in the Spanish-speaking countries of the region is ASSAL (Asociación de Superintendentes de Seguros de America Latina.)</i></p> <p><i>CAIR should be capitalized to build capacity to deal with issues of risk classification</i></p> <p><i>IAC should be given a more prominent role in CARICOM to influence policy making process</i></p> <p><i>Rating agencies to be encouraged in the insurance industry.</i></p>		<p>The recommendation to establish a regional catastrophe pool came out of the Report of the CARICOM Working Party on Insurance.</p> <p>Regional bodies such as CHA, CARILEC, IAC and CDERA, have promoted the idea of risk pooling but the matter has not influence public and private policy.</p> <p><i>CARICOM's efforts in the setting up of a regional catastrophe Pool have been limited through insularity and the absence of financial resources to complete the technical work. No work had been done sine 1999.⁴⁷</i></p> <p><i>An OECS Catastrophe pool would hardly be sustainable.</i></p> <p><i>Any semblance of a sustainable pool would have to include the entire Caribbean region.</i></p>	<p><i>Governments would be expected to encourage tax incentives when the Catastrophe Pool is established under the World Bank/CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project.</i></p> <p><i>This would be expected to be the case for a regional pool.</i></p>

⁴⁷ Interview with Allister Campbell, Director General, Insurance Association of the Caribbean (IAC) and Evelyn Wayne, Deputy Programme Manager, Macroeconomics and Trade Policy Coordinator. Trinidad and Tobago and Jamaica opted out of the discussions and the World Bank efforts have since been concentrated on Barbados and the OECS countries.

OECS and CARICOM
Table 3: Risk Transfer – Actual Practices and Gaps

Note: Actual practices are described in plain type and gaps or limitations are listed in *italics*.

	Budget Self Insurance	Market Insurance and Reinsurance	Public Asset Coverage	Risk Pooling and Diversification	Risk Financing
<i>Multilateral Lending Institutions, Bilateral Donors</i>		<p>The World Bank is providing loan financing for insurance capacity building. CFTC has provided funds for legislative reform.</p> <p>The IDB and World Bank are working with the Dominican Republic towards uniform principles in the region.</p>		<i>The World Bank, CDB OECS and Barbados Catastrophe Risk Management and Insurance Reform Project will serve as pilot project for risk pooling.</i>	

References

Interviews for risk transfer practices were done with the following persons:

- (1) Allister Campbell, Director General, Insurance Association of the Caribbean (IAC), IAC Building, Collymore Rock, St Michael, Barbados
- (2) Evelyn Wayne, Deputy Programme Manager, Macroeconomics and Trade Policy Coordinator, Bank of Guyana Building, Georgetown, Guyana.
- (3) Jeremy Collymore, Coordinator, Caribbean Disaster and Emergency Agency (CDERA), The Garrison, St Michael, Barbados