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**CARIBBEAN REGIONAL
SUSTAINABLE TOURISM
DEVELOPMENT PROGRAMME**

Competing with the Best:

**Good Practices: Natural Hazard Risk
Management in the Caribbean Tourism Sector**

The Caribbean Regional Sustainable Tourism Development Programme

This manual is an output of the Caribbean Regional Sustainable Tourism Development Programme (CRSTDP), which is a five-year (2003-2008) programme funded by the 8th European Development Fund (EDF). The overall objective of the Programme is to contribute to economic growth and poverty alleviation in the 15 Caribbean Forum of African, Caribbean and Pacific states (CARIFORUM) through increased competitiveness and sustainability of the Caribbean tourism sector. CARIFORUM comprises Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, the Dominican Republic, Jamaica, Grenada, Guyana, Haiti, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

The Caribbean Tourism Organization

The Caribbean Tourism Organization (CTO), with headquarters in Barbados and marketing operations in New York, London and Toronto, is the Caribbean's tourism development agency and comprises 32 member governments and a myriad of private sector organisations and companies. The CTO's mission is to provide, to and through its members, the services and information needed for the development of sustainable tourism for the economic and social benefit of the Caribbean people. The organisation provides specialised support and technical assistance to member countries in the areas of marketing, human resource development, research, information management and sustainable tourism development.

To order copies of this manual please contact:

The Caribbean Tourism Organization, One Financial Place, Lower Collymore Rock, St. Michael, Barbados

Tel: (246) 427 5242 Fax: (246) 429 3065

Email: ctobar@caribsurf.com URL: www.onecaribbean.org

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Acronyms

ACS	Association of Caribbean States
APELL	Awareness and Preparedness for Emergencies at the Local Level
CARIFORUM	Caribbean Forum of ACP States
CCCCC	Caribbean Community Climate Change Centre
CRSTDP	Caribbean Regional Sustainable Tourism Development Programme
CTO	Caribbean Tourism Organization
IPCC	Intergovernmental Panel on Climate Change
NGO	Non-governmental Organisation
OPDEM	Office of Disaster Preparedness and Emergency Management
PATA	Pacific Asia Travel Association
PAHO	Pan-American Health Organisation
UN	United Nations
UNDP	UN Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
(UN) ISDR	International Strategy for Disaster Reduction
(UN)WTO	World Tourism Organization
WMO	World Meteorological Organization

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Nicole Alleyne
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Pilar Bush
Patricia Maughan
Earlston McPhee
Elizabeth Riley
Dr. Ulric Trotz



Dr. Murray C. Simpson, Senior Research Associate,
Oxford University Centre for the Environment
Email: murray.simpson@ouce.ox.ac.uk Web: www.ouce.ox.ac.uk
Lead Consultant, Natural Hazard Risk Management in the Caribbean Tourism Sector Project
Carl Bro a/s, Granskoven 8, DK-2600 Glostrup, Denmark
Web: www.carlbro.com

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Executive Summary

The Caribbean is more dependent on tourism to sustain livelihoods than any other region of the world and its tourist industry is highly susceptible to damage from natural hazard events (UNEP 2008). Scientific evidence indicates that climate change is exacerbating weather-related and natural hazards (IPCC 2007 a,b,c) intensifying the threats and impacts of extreme events and natural disasters. The region's existing natural hazard challenges, coupled with the existing and predicted impacts of climate change require coastal tourism developments, in particular, to be more disaster-resilient, and to create "*a pervasive culture of disaster preparedness*" (UNEP 2008) The recent CDERA conference on developing a Disaster Risk Management Strategy for the Tourism Sector in the Caribbean highlighted the fact that there is an "*obligation on all stakeholders to elevate disaster risk management in tourism as a requirement for sustainable socioeconomic development*" (CDERA 2008)

There are a range of strategies and different options to reduce the risks of harm arising from natural hazards and to raise the capacity of communities in general and the tourism sector in particular to cope with such events. The critical function of the tourism sector in the Caribbean means that it must play a significant role in the development of a comprehensive disaster risk strategy (CDM) within the region, and to be innovative in its approaches to all aspects of reducing risk and vulnerability to impacts, in order to become more disaster-resilient.

Tourism is a vital aspect of development growth in the Caribbean and contemporary approaches to disaster risk management (DRM) address the management of hazard risks as an integral part of development (World Bank 2006). These approaches call for a comprehensive perspective, being less event-based and more focused on processes of disaster risk reduction through ongoing assessments of vulnerabilities and risks, involving a wide range of stakeholders including government bodies, NGO's, technical specialists and local communities (UNISDR 2004). The review of the literature and identification of case studies in this document highlight many of the conceptual and structural processes necessary for comprehensive disaster risk management to become a reality. The major elements necessary for integrated disaster risk management include:

- Allying DRM processes with development frameworks;
- Strengthening regional and national institutions and inter-institutional/cross-sectoral working, mainstreaming DRM into wider institutional cultures and contexts;
- Implementing regionally- and sector-relevant research and training;
- Enhancing participation in risk reduction and the development of risk management plans by communities and local populations;
- Incorporating multiple knowledge systems (scientific, policy, indigenous, local); and

- Identifying innovative financial incentives and risk sharing activities.

(e.g. see Gopalakrisnan and Okada 2007, Schipper & Pelling 2006, UNEP 2008, CDERA 2008)

For the tourism industry in the Caribbean region to become more disaster-resilient, it needs to identify and develop innovative and sector-relevant approaches to addressing all phases of comprehensive disaster risk management – risk identification, risk mitigation, risk transfer, preparedness, response and recovery. Tourism-specific disaster management plans are required at regional, national and local destination level; one method of identifying how best to develop and coordinate such planning is to learn from the practice of others who have experienced similar events and have to meet similar challenges. To this end, these case studies and the themes which emerged from the process of identifying them should assist stakeholders within the Caribbean tourism industry in developing ideas and implementing actions to help make people safer and the sector more secure, and to ensure continued and sustained development opportunities.

Introduction: Rational for Report

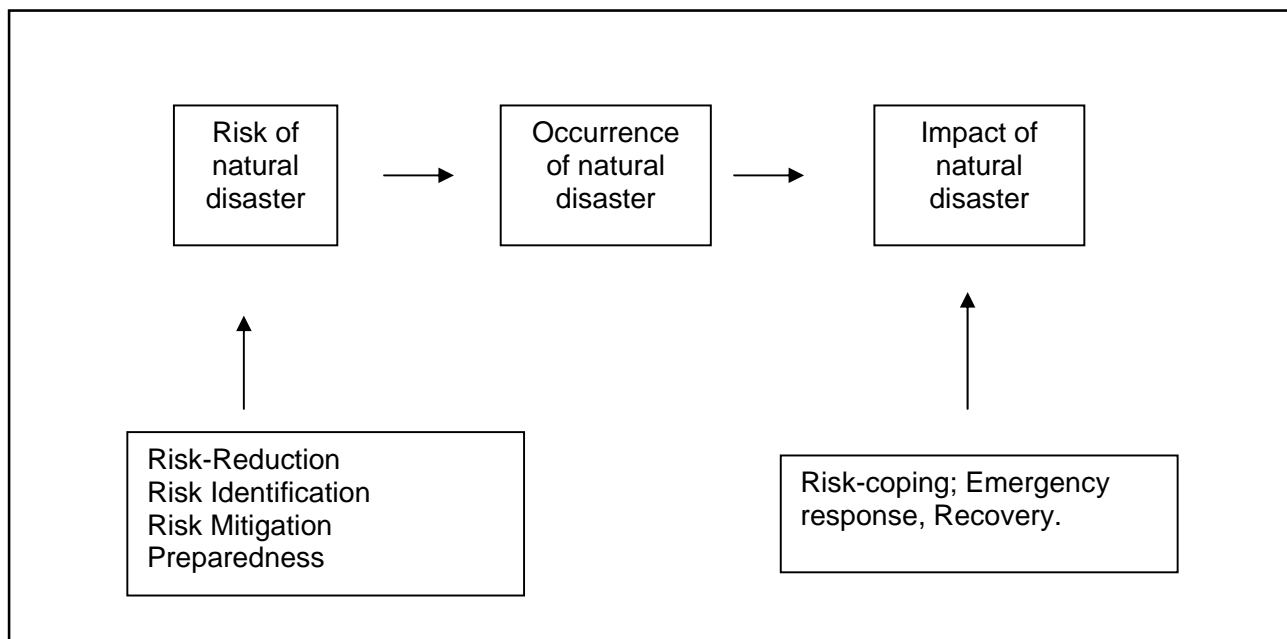
The period between 2003 and 2005 saw many major disasters triggered by natural hazards, highlighting the degree to which disaster risk underlies and threatens human security and development (UNDRR 2007). The Iranian earthquake and the heat wave across Western Europe in 2003, Hurricanes Ivan and Jeanne in the Caribbean in September 2004, the Asian tsunami in December 2004, Hurricane Katrina in the USA in 2005 and the Kashmir earthquake later that year accounted for more than 350,000 deaths and US\$194 billion of economic damage (EM-DAT n.d) Compounding these catastrophes were many more smaller-scale events which brought more localized disruption and distress to many communities.

The Caribbean region is prone to natural hazards, which have major effects on both the national and regional ability to achieve overall economic development goals (ECLAC 2005). Natural hazards historically affecting the region include hurricanes, storm surges, heavy rainfall and flooding, earthquakes, drought and volcanic activity. Contemporary evidence points to future increases in extreme events in the region as a result of anthropogenic climate changes (IPCC 2007 a, b, c), with a consequent increased risk of exposure to natural hazards for populations throughout the region. The vulnerability of Caribbean countries to natural hazards is often exacerbated by a lack of capacity in implementing the necessary strategies to reduce the risks, both within the public / policymaking and private sectors (World Bank 2002).

At a time where the region's historical agriculturally-based economy is being exposed to often negative processes of globalization, tourism is now well-established as one of the most important sectors for the Caribbean economy, if not the most important (UNEP 2008, Cartier & Lew 2005) The Caribbean 'tourism product' is predominantly focused on coastal and particularly beachfront zones and thus the sector is especially vulnerable to the impacts of extreme environmental events such as storm surges and hurricanes (Mahon 2006). In the context of strengthening socio-economic development for the region, the vulnerability of the tourism sector to natural hazards is of concern. There is a need to increase the resilience of the sector to natural hazards in order to ensure that it is able to recover effectively from extreme events when they occur. The tourism sector needs to integrate natural hazard risk management throughout its operational structure, not only because of its existing vulnerabilities but also because climate change points to the increasing impacts of natural hazards, which will have a significant future impact on the economic development of the Caribbean (UNWTO 2008; Tufts 2008; Simpson et al. 2008a; Simpson et al. 2008b). Tourism is dependent on institutional structures and environmental systems that can respond to the needs both of local people

and visitors. Disaster risk management should be viewed as an essential part of an integrated management plan for all tourist destinations (UNEP 2007)

Figure 1: A Conceptual Framework for Risk-Management (from Auffret 2003)



In light of the fact that disaster vulnerability is a reality of the Caribbean tourism industry, much good practice does exist for the management of disasters at the policy, strategic, and operational levels of the industry. The World Bank (2002) noted that there is wide experience with risk management activities across the region; however the knowledge is *“not well developed, has not been widely shared and has not been incorporated into mainstream development decisions in either the public or private sector”*. The main reasons identified for this include:

- The perception that risk management is the responsibility of government agencies responsible for disaster management rather than a shared responsibility involving sector ministries, trade associations, and the private sector;
- The low level of demand for risk management measures from the public, due to a lack of understanding of the risks involved, and the perceived cost of these measures;
- A lack of awareness-raising and public education with respect to costs, benefits and successes of hazard risk management;
- The lack of coordination between governments, regional and sector bodies, and financing institutions aimed at developing a framework for hazard risk management;
- An absence of a ‘willingness-to-act’ across governments, private sector institutions, and international financing agencies; and

- A lack of technical know-how on the use of insurance risk modelling techniques by both public sector planners and private sector local insurance industries to project potential loss exposures on both specific sites and for wider geographical areas.

It is in this context that this project seeks to identify, document and evaluate good practices that are cost effective, achievable and replicable throughout the Caribbean tourism industry and to disseminate the information, experiences and resources across all sectors and scales of activity. This document is proposed as a resource outlining the innovative activity being undertaken within this sector and others.

Background

Natural Hazards

Natural hazards have a significant impact on human socio-economic and environmental systems and their effects are often long term or even irreversible. Their socio-economic effects have increased in recent decades with the impacts being greater in less developed countries (LDCs) where “*disasters can wipe out development gains and eclipse years of development investment*” (World Bank 2006). The 2000 floods in Mozambique damaged more schools than had been financed in the preceding 20 years of World Bank development aid to the region, and the damage caused by the Kashmir earthquake in 2005 equated to the total global development assistance provided to Pakistan during the prior three years (ibid). Likewise in the Caribbean, Hurricane Ivan is estimated to have caused US\$ 4.3 billion of damage in 2004 in Grenada and the Cayman Islands (EM-DAT 2007).

In many circumstances natural hazards are events which re-occur within and across regions. Low lying areas can be identified as being at risk of flooding, areas of tectonic activity can be identified as being exposed to the risks of earthquakes and subsequent impacts e.g. tsunamis, and small island developing states (SIDS) such as the Caribbean will be at risk of hurricanes.

Natural Hazards and Climate Change

The raised exposure to both intensive and extensive disaster risk resulting from environmental hazards is driven by socio-economic processes such as urbanization, migration, poverty and environmental degradation (UNDRR 2007). In addition there is a growing acceptance of the influence of anthropogenic-induced climate change on the increasing intensity of some extreme events, and the likely impact on human and environmental systems (IPCCa,b,c); “*climate change in itself is perhaps the ultimate hazard [as] it not only magnifies existing patterns of disaster risk but is now producing dramatic changes to the planet’s ecosystems*” (UNDRR 2007). Climate change will contribute both to the environmental events that constitute natural hazards as well as to increased vulnerability to such events of human populations globally.

Natural Hazards and Natural Disasters in the Caribbean

SIDS and LDCs are increasingly vulnerable to natural disasters from both geo-climatological and socio-economic factors (Pelling & Uitto 2001). The Caribbean region is “*located among the most vulnerable regions in the world in relation to the intensity and frequency of natural and environmental disasters and their increasing impact, and face disproportionately high economic, social and environmental consequences*” (UNEP 2005). The vulnerability of the region is highlighted by the fact that across the region more than 50% of the population live within two miles off the coast and a very

high percentage of tourism development lies within the same coastal zone, so both are therefore at higher risk of damage from natural hazard events (Collymore 2008).

The 2004 and 2005 hurricane seasons highlighted the ongoing vulnerability of the region to natural hazards, with record damage to populations and infrastructure and financial losses, resulting from the impacts of extreme weather events experienced throughout the Caribbean region. Hurricane Ivan in September 2004 was one of the most severe resulting in the deaths of 28 people and destruction of 90% of buildings across the island of Grenada whilst the recorded damage to buildings and infrastructure in the Cayman Islands was estimated at US\$ 3 billion (MunichRe 2004). In 2005, insured losses totalling US\$83 billion were recorded across the Caribbean and the USA, mainly arising from the catastrophic aftermath of Hurricane Katrina; in total insured losses for the Caribbean region (including Mexico) were estimated at U.S. \$4 billion (MunichRe 2006). Hurricane Wilma in 2005 caused an estimated US\$700 million loss in Cuba (AFP 2005). Losses from such events have reduced since 2005, however the January 2008 flooding in Belize resulting from Tropical Storm Arthur, resulting in at least five deaths, and significant losses in the agriculture, fisheries and tourism sectors, as well as major infrastructure damage in affected districts is a reminder of the serious and ongoing impacts of natural hazards on SIDS and LDCs in the region (Govt. of Belize 2008). An overview of selected historical major natural hazard events and the corresponding values of loss in CTO member countries is provided in Appendix 3 to this report.

Whilst environmental factors are obviously important, the rise in natural hazard events can also be attributed to an increase in vulnerability of the region. Increased vulnerability arises from human activity and decision-making as much as by environmental threats; it can result in smaller environmental events having greater adverse effects than might otherwise have been anticipated when *“the threshold of damage loss and fatalities is reached with an ever-lower intensity of natural events”* (Mora and Keipi 2006) and they note the influence of poor environmental planning in increasing the vulnerability of some locations across the Caribbean and Latin America following Hurricanes George and Mitch in 1998, where the majority of the resulting socio-economic costs derived from inappropriate use of space for building coupled with poor design and build quality and maintenance programmes, leading to additional floods, landslides and soil erosion.

For the Caribbean region in general, the disaster impacts are higher, in terms of relative loss, for smaller islands (e.g. Antigua), and in larger islands with unstable economies and / or weak political and institutional development (e.g. Haiti) (Pelling & Uitto 2001)

Tourism and Natural Disasters in the Caribbean

Tourism in the Caribbean is the single largest sector in terms of its contribution to both employment (15.5%) and GDP (14.8%) (World Travel and Tourism Council 2004). According to the CTO, member countries attract approximately 3% of global tourism arrivals and expenditure; in 2007 the region received 22.7 million stay-over arrivals, 19.2 million cruise passenger visits and US\$27 billion in expenditure (CTO 2008). The region is therefore very dependant on tourism for employment and socio-economic development and thus vulnerable to the impacts of extreme weather events. The additional impacts on infrastructures and natural and cultural resources resulting from climate change are as yet not fully understood (UNEP 2008).

Tourism in the Caribbean is focused on coastal and beachfront zones, resulting in a high level of sector vulnerability to the impacts of extreme environmental events such as storm surges, floods and hurricanes. In the context of strengthening socio-economic development for the region, the vulnerability of the tourism sector to natural hazards is of concern. There is a need to increase its resilience to natural hazards to ensure it is able to recover effectively from extreme events when they occur. The tourism sector needs to integrate natural hazard risk management throughout its operational structure, not least because climate change predictions indicate the increasing impacts of natural hazards.

The region is vulnerable because of its primary economic focus on tourism, in spite of some areas being relatively prosperous as a result of a booming tourist trade; Barbados is ranked highly in terms of its 'developing country' status, but its vulnerability lies in the fact that its socio-economic basis is almost exclusively beach tourism which is vulnerable to both natural disasters and market fluctuations (Mahon 2006). The likelihood of consumers visiting a destination is predicated on their perception of it as safe place to be (Faulkner 2001); *"a healthy tourist economy cannot thrive and grow unless prospective tourists perceive the islands as a safe place in which to visit and vacation. A hurricane or earthquake with tremendous damage, destruction or loss of life may create a long lasting image that Caribbean SIDS are a dangerous and risky vacation setting"* (Potter 1995 from Mahon 2006), as evidence by the dramatic reduction in tourist visits to Grenada after Hurricane Ivan hit in 2004.

The essential characteristic of tourism in the Caribbean is at the same time its major risk factor for natural hazard impacts, in that the industry is almost exclusively focused on the high risk areas at the coast (Mahon 2006). Tourism itself also directly and indirectly contributes to the scale and impact of natural disasters because, for example coastal developments may increase the risks of damaging impacts through removing mangrove forests which act as buffers against storms, and effluent and

run-off from tourism developments cause reef degeneration, again resulting in higher levels of damage from storm events. Disaster loss for the Caribbean will likely come from damage to its productive coastal tourism assets and so attention needs to be given to reducing the level of inherent vulnerability brought about by the combination of coastal hazards and coastal tourist development. Mitigating the impacts of such hazards will reduce socio-economic losses brought about by natural hazard impacts and the need for reconstruction and rehabilitation of the Caribbean tourism 'product'.

Key Terms

The aim of this section is to give the reader clarification on the terminology that is used throughout this Good Practices report.

A *hazard* is the occurrence of a physical event which occurs infrequently and which presents potential dangers to those exposed to it; a physical event such as an earthquake or a volcanic eruption does not constitute a hazard unless it has the potential to impact on human populations (Twigg 2004). A *natural hazard* can be defined as a potentially dangerous environmental event which impacts on a human population. Natural hazards emerge from uncontrollable environmental activities such as:

- Internal geodynamics (e.g. earthquakes, volcanoes);
- External geodynamics (e.g. landslides, erosion, floods); and
- Hydrometeorology (cyclones, drought, hurricanes).

(Mora and Keipi 2006)

A hazardous event that causes large-scale morbidity / mortality or socio-economic damage is a *natural disaster* (UNESCO n.d). Natural disasters arise from the impacts of natural hazards within specific contexts and can result in serious disruptions to socio-economic systems and livelihood activities, quite aside from the potential for significant loss of human life. Such disasters arise out of the relationship between environmental events and the organization, development and infrastructures of society; the loss of life and economic disruption brought about by such extreme events causes impaired development, insecurity and increased poverty (World Bank 2006). Regions with unstable or poorly developed social, economic and environmental systems such as those found in many LDCs and SIDS are more vulnerable to disaster impacts arising from environmental events than more developed areas which tend to be less vulnerable and have greater response capacities.

Many disaster managements specialists argue that *natural hazards* and *natural disasters* do not exist, in that "*people are agents of disasters*" (UNESCO n.d.). For example, the damage arising from flooding may be brought about by inappropriate building on flood plains or exacerbated by deforestation and large-scale or poorly planned development in hazard-prone areas, leading to

disasters for at-risk communities. This concept of natural hazard and natural disaster contrasts with perceptions of natural hazards as unavoidable and brought about by the unrestrained forces of nature; it shifts the burden of cause from purely natural processes to the combination of human activities and natural events (Mora and Keipi 2006).

Risk relates to the likelihood of an event happening coupled with the losses its occurrence would involve; “*expected losses resulting from interactions between natural or human-induced hazards and vulnerable conditions*” (United Nations 2004). *Disaster risk* is the “*potential for damage and loss associated with the occurrence of diverse types, intensities and magnitudes of physical phenomena, affecting exposed or vulnerable populations, their livelihoods and infrastructures*” (ICSU 2008).

Disaster risk management (DRM) is a process aimed at reducing risk to acceptable levels and coping with the consequences of events when they materialize. *Disaster risk reduction* involves such activities as:

- Promoting risk awareness and assessment, hazard analysis and vulnerability/capacity analysis;
- Enhancing knowledge through education, training, research and information;
- Strengthening public commitment and institutional frameworks, including organisational, policy, legislation and community action;
- Implementing and enforcing wider management measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments; and
- Establishing early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.

(ISDR 2004a)

The concept of *vulnerability* relates to a combination of physical, social, economic, and environmental circumstances which increase the susceptibility of a community to the impact of hazards (ISDR 2006); vulnerability in this sense refers to an inherent predisposition to be adversely affected or unable to cope with events (IPCC 2007b). Vulnerability to natural hazards “*is the nexus of physical processes and human systems*” (Boruff & Cutter 2007) and an increased vulnerability to extreme events – the ‘inherent predisposition’, arises from a combination of geo-physical characteristics, such a geographical proximity to moving tectonic plates or specific climatological phenomena, and socio-economic factors, such as political instability, poverty or limited economic diversity, which in combination result in a reduced capacity to respond to natural hazard threats. The occurrence of extreme environmental events does not necessarily imply a disaster: “*it is poverty and powerlessness that make people vulnerable*” (Oxfam Briefing Paper 108 n.d.).

There are primary, secondary and tertiary impacts arising from natural hazards (Patwardhan and Sharma 2005). *Primary impacts* are those resulting directly and immediately from the event itself “*direct damage to stocks of human and economic capital*”. *Secondary impacts* are often delayed and do not necessarily occur at the site of the initial event e.g. the outbreak of disease or ongoing disruption of economic activity in neighbouring regions. *Tertiary impacts* are those that often occur over a longer timeframe and which may be widespread, such as changes in insurance rates and property taxes, or in the case of the tourist sector, decreased tourist visits. A major consideration when assessing the likely impacts of natural hazards is the exposure to the hazard in terms of populations, property and preparedness for the event (Mahon 2006).

In addition, recurrent small-scale events can result in cumulative adverse effects producing damage equivalent to a larger disaster. The recent UN Disaster Reduction Report (UN DRR 2007) noted the increasing impact of both *intensive* disaster risks, where large populations and economic activities are likely to experience catastrophic disaster impacts from large-scale hazard events, as well as *extensive* disaster risks where more dispersed populations are likely to experience localised, low intensity but cumulative impacts from small-scale, mainly climatic hazards.

Aims, Objectives and Methodology

Aim

This technical assistance project aimed to develop a user-friendly, accessible and sector-relevant document for CTO member states, presenting innovative examples of good practice in natural hazard risk management (NHRM) in order to provide guidance for reducing the vulnerability of tourism sectors to natural disasters and increasing economic resilience when they do occur.

Objectives

- To identify relevant NHRM case studies, drawn initially from international activity, and subsequently from regional and national activities;
- To evaluate the case studies for particularly innovative approaches which might be applicable within the Caribbean tourism sector;
- To select case studies on the basis of defined selection criteria, which best indicate sector-relevant, innovative good practice in NHRM; and
- To present the findings in a 'Good Practice' document available for dissemination within the region and beyond.

Methodology

Inception phase

The project started with desk-based research on the existing and potential natural hazards to which the Caribbean Tourism Sector is susceptible. This was followed by a global overview of international initiatives taken by national bodies, NGO's, tourist destinations and stakeholders to mitigate hazards. Subsequently an assessment was conducted into examples of NHRM activities from across the Caribbean at regional and national levels.

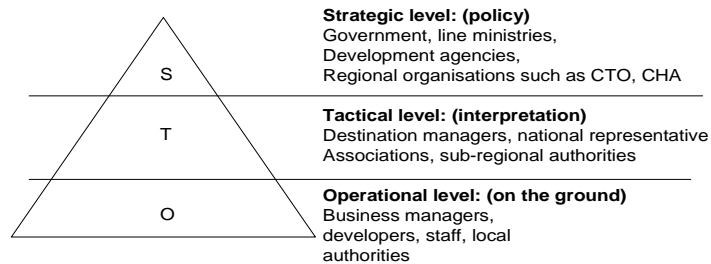
The terms of reference for the project identified the need to link good practice case studies to phases of the established Disaster Risk Management Cycle (DRM) and/or Comprehensive Risk Management (CDM) methodology. This structure would provide a pedagogic means of showing tourism destination stakeholders what strategies can be pursued to improve each of the aspects identified within the cycles.

Criteria for selection of case studies

Subsequent to the initial trawl to identify examples of NHRM activities, a draft set of selection criteria were formalized. The selection criteria were:

1. Case studies to be selected with the aim of representing a range of strategic, tactical and operational levels:

Figure 2: Strategic, Tactical and Operational Levels of Implementation



2. Sufficient range of case studies to be selected to link at least one case study with each phase of the DRM / CDM cycle. For the purposes of this report, the case studies are presented using the CDM terminology which is more comprehensive.
3. Case studies to be selected providing a sufficient geographical and 'natural hazard' typology range to present useful guidance for tourism destination stakeholders across the region.
4. Good practices need to be transferable, so case studies were selected that involved practices that are relatively simple to implement and have a broad relevance for the Caribbean tourism sector.

The selection criteria were subsequently applied to the global, regional and national examples of NHRM activity, to identify those most appropriate for inclusion into the Good Practice document.

The global/regional overview along with the developed criteria fed into the development of a survey questionnaire for circulation to stakeholders identified by CTO and CDERA at the national and regional level. The survey took an inclusive approach to the tourism sector, focusing not only on tactical/operational level NHRM activities of economic importance for the tourism sector but also on the steps taken by central planning organizations at the strategic level to integrate the provisions of disaster risk management. The aim was to identify current NHRM activity within the Caribbean-tourism-sector as well as additional case studies for inclusion the Good Practice document.

Stocktaking exercise

In this phase, further desktop research was conducted, reviewing national and regional Disaster Risk Management (DRM) frameworks and their interface with the tourism sector. This phase also served as a gap analysis of the DRM frameworks with the objective of recommending improvements in the frameworks. The review of the DRM framework and the related gap analysis further informed the questionnaire developed in the Inception Phase for circulation to CTO/CDERA national and regional contacts.

Field Visits to selected case studies

Based on the information gleaned in the first two project phases, a range of good practice examples were selected using the agreed criteria. In addition, the survey questionnaire was disseminated with the assistance of CTO/CRSTDP.

Once potential regional and national case studies were identified from the desk research and questionnaire phases, the Natural Hazard Risk Management Consultant undertook missions to CARIFORUM countries to validate sampled cases. The countries visited by the NHRM Consultant within the resource framework of this project were Barbados and Jamaica. Where possible, validation was also achieved through private and public sector stakeholder meetings.

Analysis of results

The Terms of Reference for this project proposed that the DRM cycle or the CDM cycle could be used as a pedagogic means of conveying good practices to stakeholders. There are many synergies between the two approaches, with the Comprehensive Risk Management Cycle including aspects of risk transfer which is of central importance for the tourism sector. The case studies identified have been analyzed and presented within the context of these cycles.

Reporting and dissemination of results

The outputs from the phases of the project are presented within this current document, which is published to complement others in the 'Good Practice series produced by the CTO.

Comprehensive Disaster Risk Management

Until recently, disasters were viewed as disconnected events, such as a hurricane or an earthquake and adequate responses could only be made after such events occurred. However, the environmental, human and economic damage arising from such events are now understood to be based in the pre-event vulnerability of at risk populations (World Bank 2002). The effects of natural disasters can be minimized through risk management activities aimed at reducing current and future vulnerability to harm, as well as enacting preparedness and response activities to safeguard lives.

Disaster risk management (DRM) is a process of minimising and managing the risks inherent in natural hazard events whilst at the same time decreasing vulnerability to such events. It implies a systematic process to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. It includes organizational, administrative, structural and non-structural measures to avoid and / or limit the adverse effects of hazards (ISDR 2004). The DRM cycle identifies four stages in the lifecycle of disasters (Twigg 2004):

- Prevention/mitigation;
- Preparedness;
- Response; and
- Recovery.

Comprehensive Disaster Management (CDM) (Figure 3) is an emerging framework which places a greater emphasis on an integrated approach to disaster risk, involving the wider management of natural resources and natural / human-induced hazards (CDERA 2007); it is a systematic process to lessen the impacts of hazards through the implementation of disaster risk reduction policies derived from integrated decision-making at multiple levels and scales: strategic, policy, institutional and organization, operational and resource, monitoring and evaluation, research, development and training, and through engaging community participation at every stage (CDERA 2008).

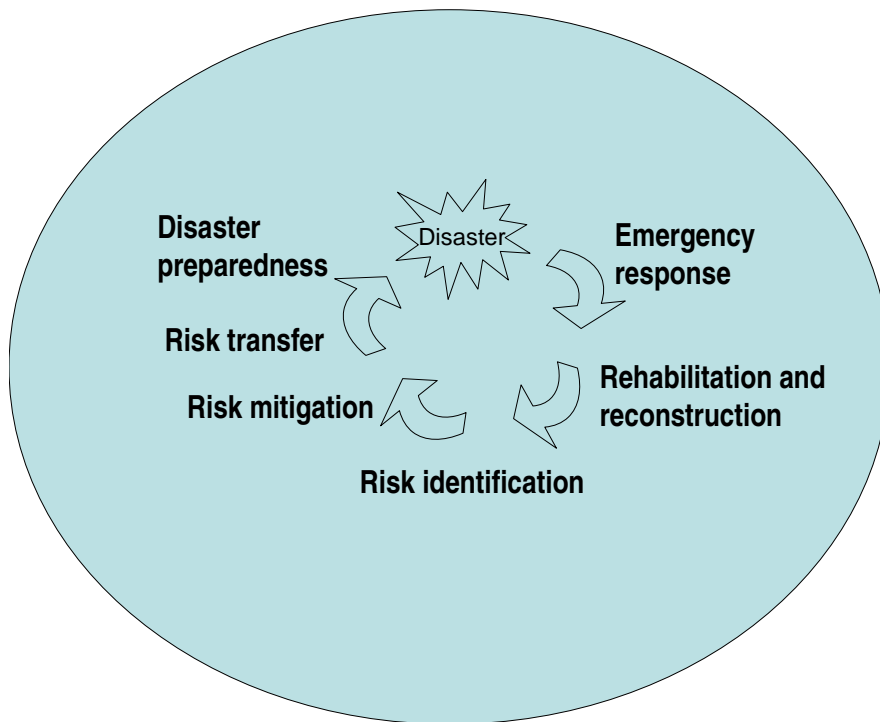
CDM re-emphasises and re-configures the phases of the disaster management cycle defined within DRM in greater detail, identifying three interrelated categories of risk management actions aimed at long-term hazard management:

- Risk identification
- Risk mitigation
- Risk transfer

as well as the additional DRM aspects of:

- Disaster preparedness;
- Emergency response; and
- Rehabilitation/reconstruction.

Figure 3: The CDM Concept Cycle



CDM also aims to encourage and enable all scales and sectors of society (government and private sectors, civil society, populations in urban and rural communities and especially those in hazard prone areas) to participate in, and take responsibility for reducing exposure to risks. CDM is “*multi-hazard and multi-sectoral in its application and is concerned primarily with integrating vulnerability assessment and risk reduction into development planning and management*” (UNDP n.d.) It requires major changes within established socio-economic and organisational systems including development planning, livelihoods, infrastructure design and maintenance, development and location of capital project and the implementation of building standards (World Bank 2006)

For the purposes of this report and in line with current developments in the Caribbean region, the case studies are presented using the CDM terminology which is more comprehensive.

Risk Identification

Risk identification involves assessing risks to quantify the temporo-spatial aspects of natural hazards and whose objective is to forecast the location, frequency, duration and magnitude of natural hazards and the vulnerability of populations exposed to such risks (Auffrett 2003). Risk identification activities can include hazard data collection and mapping, vulnerability assessment, risk assessment and post-disaster assessment (World Bank 2002).

Risk Mitigation

Risk mitigation focuses on reducing the physical, social and environmental vulnerability of human populations to risks through risk reduction activities (ISDR 2004). Such activities can include enforcing building standards, changing land use planning and resource management behaviours, constructing dams or re-channelling rivers to limit the likelihood of floods downstream; reforestation watersheds and stabilizing slopes to prevent landslides, or diversifying economic activity (Auffrett 2003, World Bank 2002). Mitigation can also be aided by learning from previous disasters.

Risk Transfer

Vulnerability to the impacts of disaster cannot usually be eliminated altogether and in these circumstances other protective mechanisms are required (World Bank 2002). In such cases, risk-coping strategies are necessary, offering the opportunity to reduce the consequences of disaster events by sharing risks or spreading the cost of impacts rather than reducing the amount of damage per se (Auffrett 2003). Risk transfer activities include accumulation of personal savings, interaction with financial markets (stocks, shares etc) and insurance cover. Risk transfer does not reduce actual vulnerability and is expensive, and so should complement and follow other efforts aimed at reducing vulnerability to risk (World Bank 2002). The Caribbean region relies heavily on reinsurance markets and so costs are additionally exposed to global events unrelated to any immediate incidents in the region - Auffrett (2003) notes that the insurance market *for "catastrophic risk in the Caribbean region remains a "thin" market characterized by "high" prices and "low" transfer of risk"*. Risk transfer approaches can include budgeted self-insurance, market insurance and re-insurance, public asset coverage, risk pooling and diversification and risk financing (World Bank 2002).

Disaster Preparedness

Preparedness consists of activities to lessen the impact of disasters by boosting the underlying capacity to respond in the event of an emergency, in advance of the need for such a response. This is done through, for example ongoing monitoring of hazards, forecasting and early warning systems, evacuation plans and shelters, specialized networks of responders and contingency plans in critical

sectors (Auffrett 2003). Such activities focus on short-term damage control rather than reduction of vulnerability (World Bank 2002).

Emergency Response

The response phase involves the provision of assistance or intervention during or immediately after a disaster to preserve life through the provision of basic subsistence needs, medical assistance and recovery of people affected. In theory an immediate / short-term measure, evidence from previous disasters show that emergency response requirements are often protracted (ISDR 2004)

Recovery - Rehabilitation and Reconstruction

This phase includes the range of decisions and actions taken after a disaster which aim to restore and/or improve the pre-disaster situation of the affected community. This phase also involves processes of facilitating future disaster risk reduction, and so feeds back into the risk identification, mitigation etc. phases of the management cycle. Recovery processes provide the opportunity to learn from previous events and implement disaster risk reduction measures (ISDR 2004)

Case Studies of Good Practice in NHRM

Disaster risk management is a process which crosses contexts, scales and sectors and the sharing of knowledge and experience from other sectors and / or from other contexts is essential.

This section identifies case studies and programmes of relevance to the stages of DRM/CDM. They are not all specific to the management of disaster risk in the tourism sector, but have been selected on the basis of providing evidence of innovative, transferable practices and outcomes based on aspects of the DRM/CDM cycles identified. Case studies have been identified which identify CDM phases and activities in a range of regions and hazards, and on the basis of their strategic, tactical or operational contexts. They might offer ideas which might be usefully applied to such contexts within the Caribbean region and thereby provide a way forward on ideas for what can be done in the region's tourism industry.

This good practice guide is intended as a user-friendly 'strategic tool', offering guidance for users to proactively plan and implement actions to reduce the vulnerability of their tourism sectors to natural disasters and create greater economic resilience when they do occur. The case studies identified are by no means exhaustive but within the context and limitations of this study, offer a range of activities to provide guidance and stimulate thinking. The activities are practical and / or conceptual and indicate the wide scope of initiatives that can enhance disaster -resilience.

Global Case Studies of Good Practice in NHRM

There is wide evidence available on disaster risk management activities across the globe where natural hazards challenges are being identified, vulnerabilities reduced and capacities enhanced. The following is a selection of studies identified as offering ideas and activities which might be transferable to disaster planning in the Caribbean tourism sector. In addition, they identify concepts and themes which have been identified as vital to any comprehensive disaster risk management planning.

Global NHRM Good Practice Case Study 1: Indonesia

Good practice identified

Oxfam PRIME project – a humanitarian disaster risk reduction project in Indonesia, aimed at learning lessons from the Asian tsunami and strengthening preparedness and responses capacities at national, regional and local levels.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response	Indonesia	Multi-hazard, Initiated following Asian tsunami in 2004	All sectors

Level of implementation

Strategic, tactical, operational – National Disaster Management Bill with Oxfam, ministerial workshops; capacity building for NGO's; capacity-building for local communities and institutions

Innovative perspectives and transferable practices

- Awareness-raising on the human aspects of disaster causation across sectors and levels;
- Mapping of partners in region – NGO's, sector groups etc to encourage networks;
- Multi-sectoral response plans established involving health, food, livelihood, security, shelter and advocacy partnerships;
- Working with partners to engage with local communities in disaster risk reduction especially in areas of recurrent natural disasters through e.g. local hazard mapping;
- Producing CB-DRM information kits, workshops, drill etc. to enhance preparedness, specific to circumstances (location, hazard exposure, sector, gender, institution); and
- Active support for the development of networks for information sharing etc. and collaborative activities to coordinate emergency response plans.

Issues associated with implementation

Cost perceptions.

Challenged by the high level of multi-sectoral, cross institutional activity required.

Further information

Oxfam Prime Project

<http://ochaonline.un.org/OchaLinkClick.aspx?link=ocha&docid=1060024>

Global NHRM Good Practice Case Study 2: Vietnam

Good practice identified

Community-based Disaster Risk Management Alternative - a project assessing the role and potential of community-based DRM (CB-DRM) in Vietnam.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk transfer Preparedness Response Recovery	Vietnam	Multi-hazard	All sectors

Level of implementation

Operational - community level capacity building

Innovative perspectives and transferable practices

- Focus on reducing vulnerability and increasing capacity of local communities, empowering them to be pro-active in preparing for and responding to disaster events within their socio-economic / environmental contexts, with external support as necessary - “*disaster-resilient communities*”
 - Recognise the need for empirical evidence of importance of CB-DRM;
 - Highlighted aim to look at the relationships between technical, social, economic and environmental causes / impacts of disasters;
 - Link disaster risk reduction with wider development issues;
 - Importance of community–level preparation (food storage, evacuation, coordination) and risk transfer (savings and credit schemes);
 - Importance of ‘social capital’ in disaster planning and response and especially during recovery;
 - Highlights the role of indigenous knowledge, derived from a long history of disaster and risk exposure, for identifying, mitigation, preparing and responding;
 - CB-DRM occurs in all communities but is not sufficiently recognised or supported; and
 - School-based awareness initiatives.

Issues associated with implementation

Communities are heterogeneous.

Decentralization does not necessarily reduce power inequalities – often just move them elsewhere.

CBDRM approaches may compete for resources with other forms of DRM activity.

Often requires major systemic change toward decentralization.

Sustainability of local level activities may be more difficult to sustain and monitor.

The lack of integration of location-specific disaster risks into wider development planning results in development efforts being undermined by recurring natural disasters.

Further information

Phong Tran 2005. *Disaster Risk Management: A Community Based Alternative in Central Vietnam*; International Environment and Disaster Management Program, Kyoto University, Japan.

http://www.iedm.ges.kyoto-u.ac.jp/seminar_rajiblab/051223-010.pdf

Global NHRM Good Practice Case Study 3: Netherlands

Good practice identified

Mobilizing resilience from below - linking institutions to actors and knowledge to decisions - a study investigating the role of institutional and sectoral collaboration and knowledge sharing in response to flood risk management and the importance of multi-level level governance in disaster risk management

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk mitigation Preparedness Response Recovery	Netherlands	Flood	All sectors

Level of implementation

Strategic – government

Tactical

Operational

Innovative perspectives and transferable practices

- Institutional dynamics can build resilient socio-ecological systems to anticipate and cope with hazards and disasters;
- DRM as strengthening communities' resilience against natural disasters rather than 'curative' approach;
- Highlights importance of role of and relationships between national, regional and local institutions in empowering communities at risk – “*institutionalizing resilience*”;
- Makes explicit the necessary links between awareness, training and communication activities;
- Emphasis on the links between scientific, sectoral and local knowledges necessitating partnerships between knowledge-holders and decision-makers; and
- Highly focused on integrated risk management processes.

Issues associated with implementation

Decentralization and multi-level governance is expensive and can be bureaucratic.

Sustainability of partnership working requires high levels of monitoring and management.

Further information

Oft, P, Tsuma, W 2006. “*Mobilizing resilience from below*”: *Linking institutions to actors and knowledge to decisions*. Centre for Development Research, University of Bonn

http://www.zef.de/fileadmin/downloads/forum/docprog/Termpapers/2006_1_Oft_Tsuma.pdf

Global NHRM Good Practice Case Study 4: Armenia

Good practice identified

“Terra non Firma”: an Entertainment Tool for Raising Earthquake Awareness of Pre-and Primary-School Children - a project developing education materials to raise awareness of earthquake risk in schools

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness Response	Armenia	Earthquake	All sectors

Level of implementation

Tactical

Operational

Innovative perspectives and transferable practices

- Education for school-children in risk-prone areas is vital to ensure they are aware of risks, of what to do if disaster strikes and to reduce levels of stress;
- National Seismic Protection Agency, Education Ministry and schools produced a theatrical performance to teach children how to prepare and what to before, during and after an earthquake, through interactive education-play; and
- Approach expanded through the use of video recording of the performance and the production of additional material to support the video.

Issues associated with implementation

Need to ensure suitability across age ranges during initial implementation.

Further information

Total Disaster Risk Management – Good Practice 2008. Asian Disaster Reduction Centre.

http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/PDF/PDF-2008e/1.Armenia.pdf

Global NHRM Good Practice Case Study 5: India

Good practice identified

Disaster Risk Management Programme - a project aiming to development and mainstreaming of Disaster Management Plans at state, district and community level.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response	India	Multi-hazard	All sectors

Level of implementation

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- Location and risk – specific training, capacity building and in developing disaster management plans in village, district, urban etc. communities;
- Focus on training for women in first aid, shelter management water sanitation, rescue and evacuation;
- Developing specific disaster risk reduction and response training manuals for different group and sectors;
- Disseminating disaster-related information at community level to instil a culture of mitigation and preparedness;
- Strengthening institutional and administrative systems for DRM; and
- Identifying good practice at local levels for dissemination and sharing.

Issues associated with implementation

Require high level commitment from government

Further information

Total Disaster Risk Management – Good Practice 2008. Asian Disaster Reduction Centre.

http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/PDF/PDF-2008e/2.India.pdf

Global NHRM Good Practice Case Study 6: Indonesia

Good practice identified

Landslide Hazard Mitigation - the development of mitigation framework in order to marshal human resources in coping with landslide risk.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response	Indonesia	Landslide	All sectors

Level of activity

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- Hazard mapping based on hydro-geological, local and historical information;
- Early warning system to provide information during times of risk e.g. high rainfall, to network of local government offices;
- Quick response teams to visit at risk areas and provide technical assistance aimed at preventing landslides and reducing their impact; and
- Effective use of broadcast media for enacting drills and real-time information dissemination.

Issues associated with implementation

Require government implementation and financing

Further information

Total Disaster Risk Management – Good Practice 2008. Asian Disaster Reduction Centre.

http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/PDF/PDF-2008e/3.Indonesia.pdf

Global NHRM Good Practice Case Study 7: Japan

Good practice identified

Resident Disaster Planning and Disaster Drills - a project to enhance community preparedness through participation in identifying and managing risk.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness	Japan	Landslide and avalanche	All sectors

Level of activity

Tactical
Operational

Innovative perspectives and transferable practices

- Volunteer-based Disaster Preparedness Committee;
- Disaster risk maps identified and disseminated through committee system;
- Household Evaluation Plan and Checklist developed and distributed to all residents; local residents use charts and plans to measure rainfall and monitor other 'precursor events' in order to self-evaluate risks;
- Regular disaster drills to inform self-monitoring systems; and
- Wider community networks have been stimulated by cooperation and collaboration on disaster risk management, which reinforce the programme itself.

Issues associated with implementation

High level education programme required

Further information

Total Disaster Risk Management – Good Practice 2008. Asian Disaster Reduction Centre.

http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/PDF/PDF-2008e/4.Japan.pdf

Global NHRM Good Practice Case Study 8: Sri Lanka

Good practice identified

Community capacity building for minimising tsunami impacts through education and awareness-raising.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness	Sri Lanka	Earthquake/Tsunami	All sectors

Level of activity

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- Large scale community awareness programme using specially-trained military personnel to act as coordinators;
- Trained to provide information on disaster risk and management, provide relevant written and verbal information, how warnings about events will be disseminated, how to develop local hazard maps, safe evacuation and shelter techniques and mock drills and simulations; and
- Military personnel were perceived of as being 'trustworthy' information givers.

Issues associated with implementation

Requires high level cross-ministerial action

Difficulties of identifying 'the community'

Further information

Total Disaster Risk Management – Good Practice 2008. Asian Disaster Reduction Centre.

http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/PDF/PDF-2008e/8.SriLanka.pdf

Global NHRM Good Practice Case Study 9: Philippines

Good practice identified

Integrated Community Disaster Planning Programme / Promise Project - a series of initiatives developing integrated community disaster planning encouraging knowledge-sharing and co-working between communities facing similar risks.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response	Philippines	Multi-hazard	All sectors

Level of activity

Strategic,
Tactical
Operational

Innovative perspectives and transferable practices

- Mitigation transcends disaster planning e.g. building and sanitation planning impacts on disaster mitigation and health needs, so cannot be managed in isolation;
- Capacity-building is an ongoing process not a single occurrence;
- Community construction of physical mitigation structures such as dykes and walls can aid cohesion and solidarity;
- CB-DRM activities complement not replace top down approaches; and
- Identification of the importance of cross-scale collaboration.

Issues associated with implementation

Continuous lobbying and advocacy is required to ensure ongoing political commitment to community disaster reduction initiatives e.g. incorporating community risk maps and disaster action plans into land use planning and policy.

Persuading communities that long term planning (e.g. evacuation centres, building dykes) might need prioritizing over short term concerns (improving and already adequate water supply) is difficult, especially for infrequent hazards.

Further information

Integrated Community Based Risk Reduction in Practice, 2003. International Federation of Red Cross and Red Crescent Societies

<http://www.ifrc.org/Docs/pubs/disasters/resources/about-disasters/cs-philippines.pdf>

Victoria, L., 2002, *Impact Assessment Study of the Orissa Disaster Management Project*, Asian Disaster Preparedness Centre

<http://www.adpc.net/infores/adpc-documents/orissaeval.pdf>

Promise Project Narrative Progress Report, Asian Disaster Preparedness Centre

http://www.adpc.net/v2007/Programs/UDRM/PROMISE/MONITORING%20&%20EVALUATION/Monthly%20Status%20Reports/Downloads/2007/2007_08_Dagupan.pdf

Global NHRM Good Practice Case Study 10: Mozambique

Good practice identified

Adaptation to increased storm events, extreme wind events (cyclones) and storm surges which cause structural damage and shoreline erosion - a project financed by the World Bank to build new sea defences in the major tourist town of Vilankulo town, Inhambane Province, Mozambique to include ecological options for the protection of a coastal tourist area. Strong tides and cyclones damaged the existing sea wall structure in this important tourist destination and ecological options for protection (e.g. vegetated sand dunes) are being explored rather than heavy infrastructure, after similar weather systems in South Africa indicated that infrastructure protected by naturally vegetated coastal dunes were better protected than those with sea walls.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation	Mozambique	Storms, storm surges, cyclones	Tourism

Level of activity

Strategic
Operational

Innovative perspectives and transferable practices

- Recognising the need to assess the use of alternative responses to damage caused by extreme weather events; and
- Learning from previous events and similar occurrences elsewhere.

Issues associated with implementation

Requires evidence of effectiveness of response solution.
Requires costs benefits assessments.

Further information

Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. and Gladin, E. (2008) Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices. UNEP, University of Oxford, UNWTO, WMO: Paris, France.

<http://www.unep.fr/shared/publications/pdf/DTIx1047xPA-ClimateChange.pdf>

Global NHRM Good Practice Case Study 11: Fiji

Good practice identified

Coastal development and planning practices - developing and implementing building codes and disaster planning for coastal tourist business across Fiji, involving strong enforcement and monitoring.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation	Fiji	Cyclones, storm surges	Tourism

Level of implementation

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- Stringent building codes and strong enforcement (with ongoing review) so that resorts are now built at least 2.6 m above mean sea level and 30 m off the high tide mark and structures must be able to withstand wind speeds of 60 km per hour (with ongoing review); and
- Larger tourist businesses / resorts must develop evacuation plans, insurance cover and training procedures before the start of the cyclone season, including staff training, water and food storage, first aid kits, trimming of trees and a direct line to the Meteorological Service for early warnings, and implement ongoing monitoring of these plans.

Issues associated with implementation

Requires sustained commitment and action on the part of operators and business.

Requires sufficient enforcement procedures.

Further information

Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. and Gladin, E. (2008) Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices. UNEP, University of Oxford, UNWTO, WMO: Paris, France.

<http://www.unep.fr/shared/publications/pdf/DTIx1047xPA-ClimateChange.pdf>

Global NHRM Good Practice Case Study 12: India, Thailand

Good practice identified

APELL Demonstration projects for Planning for Disaster Management in Coastal Tourism - various projects overseen by the UNEP assessing disaster risk management approaches.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response	Kanniyakumari in Tamil Nadu India, Patong in Phuket and Pi-Pi Island in Krabi of Thailand	Extreme Weather Events	Tourism

Level of implementation

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- “Disaster Reduction through Awareness, Preparedness and Prevention Mechanisms in Coastal Settlements in Asia - Demonstration in Tourism Destinations” aims to increase the disaster management capacity of main disaster and tourism stakeholders in 3 tsunami hit destinations;
- Achieved through improving the local authorities’ and the private sector’s ability to manage natural and man-made disasters;
- Training residents and tourists to prepare / respond to disasters, as well as co-operate with the authorities during mitigation efforts;
- APELL is a process to create public awareness of hazards and to ensure that communities and emergency services are adequately trained and prepared to respond; these projects aim to improve the ability of coastal communities to deal with disaster by working with all actors (including hotel and restaurant operators, local authorities, rescue agencies), to establish local mechanisms and processes for disaster preparedness and reduction;
- The outcome will be an APELL “tool kit” for tourism destinations and will include awareness-raising materials, local agreed pictograms, training material for hospitality and tourism companies in the destinations, communication strategies, and tools on crisis communication for use by hotel and restaurant operators;
- The impacts of disasters can be substantially reduced if surrounding communities and emergency services are fully informed about possible hazards, and have been educated about risk management and crisis management plans;
- Community awareness and involvement are key factors in mitigating and limiting the impacts of disaster and are key aspects of APELL processes; and
- International learning opportunities between Project destinations.

Issues associated with implementation

Requires cross-sector and inter-department cooperation.

Further information

Disaster Risk Reduction in Tourism Destinations - Disaster Reduction through Awareness, Preparedness and Prevention Mechanisms in Coastal Settlements in Asia - Demonstration in Tourism Destinations, <http://www.unep.fr/shared/publications/pdf/DT1x0921xPA-DisasterTourism.pdf>

Global NHRM Good Practice Case Study 13: The Maldives

Good practice identified

SIDS coping with natural disasters - following the 2004 tsunami, the Government announced a Safer Island Development Programme (SIDP) seeking to provide the infrastructure necessary to adapt to natural disasters and climate change. A disaster management strategic framework and procedures manual was developed across many sectors, with one strand specific to the tourism sector.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation Preparedness Response Recovery	The Maldives	All hazards	Tourism

Level of activity

Strategic, tactical – Government ministries, island authorities

Innovative perspectives and transferable practices

- A Tourism Emergency Operations Centre was established with the aim of enhancing disaster-resilience in the tourism sector, serving as the government focal point during any emergency, serving as a complement to but not part of the National Disaster Management Organisation;
- Several Themes were developed – crisis communication procedures, environment and safety, vulnerability assessment and disaster risk reduction, fiscal and interagency measures, tourism – specific capacity building programme and disaster risk reduction and recovery guidelines;
- A hotel and resort sector disaster management procedures manual was developed, containing e.g. staff training, emergency team management, evacuation, communications, insurance, guidelines and resort DRM checklists;
- The idea of the Safe Islands concept was developed, recognizing the extreme vulnerability of the Maldives, and developing measures to mitigate ecological disasters with the aim on enabling communities to sustain economic and social development by providing ecologically safe zones;
- Safe Islands concept aims to mitigate impacts of natural hazards by establishing building / construction codes facilitating vertical evacuation and providing basic services in an emergency, (health, communication and transport infrastructure);
- Disaster mitigation providing areas of high ground, elevated public buildings for evacuations, drainage areas for flooding, buffer food/water storage and preparedness through raising community awareness;
- 'Designated safe island' system enables safer islands to assist islands in need; and
- DRM exists within an overarching policy of long-term sustainable development in line with the government policy of 'building back better' following the tsunami.

Issues associated with implementation

Requires high level inter-sectoral coordination and cooperation – tourism development, land use planning, construction, health and emergency planners, environmental bodies.

Further information

Republic of the Maldives Disaster Management Strategic Framework and Procedures Manual – Tourism sector (2005); http://www.mv.undp.org/Images/Maldives_final_Plan_AUGUST_2029.pdf

Global NHRM Good Practice Case Study 14: El Salvador

Good practice identified

Federal government-initiated finance scheme - El Salvador's Social Protection Funds provides social investment funds (SIFs) from the federal government for use in providing rapid assistance to poor communities. Social investment funds provide resources for small construction works, such as retrofitting or adjustment of structures to extreme weather conditions.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Mitigation Risk Transfer	El Salvador	All hazards	All sectors

Level of implementation

Strategic, operational involving federal government funds and local authority organizations and communities

Innovative perspectives and transferable practices

- SIFs mobilize and disburse government resources and expand operations rapidly at the local level, maintain direct contact with poor communities, operate in a decentralized manner, and work closely with civil society organizations and local governments;
- The funds contribute to damage prevention activities and financial schemes aimed at risk reduction; and
- SIFs reduce vulnerability by creating employment, generating social services for the poor, and widening community based civic action.

Issues associated with implementation

Clearly defined responsibilities are required for all parties involved in the scheme. Requires monitoring and reporting to ensure equitable allocation and transparency.

Further information

Warner, K., Bouwer, L., Ammann, W., (2007). 'Financial services and disaster risk finance: Examples from the community level'. *Environmental hazards* 7(1) 32-39.

El Salvador's Social Protection Funds FISDL (www.fisdg.gob.sv)

Global NHRM Good Practice Case Study 15: Kenya

Good practice identified

Re-planting mangroves in coastal zones to improve protection against extreme weather events for the Mida Creek Community, Watamu, Kenya, through a UNDP grant.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk mitigation	Kenya	Extreme winds and storms	All sectors

Level of implementation

Strategic, Tactical – Government ministries, island authorities

Innovative perspectives and transferable practices

- Community participation focus – the construction of a picnic site and boardwalk included within in planted mangrove forest on the Kenyan coast, was conducted in consultation with the local community, and in cooperation with Kenya Wildlife Services;
- The development has additional benefits: local women’s groups make honey from hives amongst the mangroves and the site receives about 150 tourists per week, who pay to use the boardwalk, and may also hire one of 5 local guides; local school children visit and students receive environmental education and contribute; and
- directly to conservation programs; awareness is raised of the importance of the mangrove forest as a breeding and nursery grounds for the fish they catch in the sea.

Issues associated with implementation

Ongoing monitoring is necessary – the mangroves are currently threatened by people collecting poles for commercial timber.

Further information

Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. and Gladin, E. (2008) Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices. UNEP, University of Oxford, UNWTO, WMO: Paris, France.

<http://www.unep.fr/shared/publications/pdf/DTIx1047xPA-ClimateChange.pdf>

Global NHRM Good Practice Case Study 16: India

Good practice identified

The strength of networks - networks of small NGOs and community groups in India launched key local responses to the Asian tsunami in 2004.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Response Recovery	India	Tsunami	All sectors

Level of implementation

Operational – local NGOs and community groups

Innovative perspectives and transferable practices

- An established network of 12 local NGOs forming the East Coast Development Forum met the needs of a direct relief programme, rehabilitation through a projects aimed at restoring and strengthening livelihoods and through an advocacy programme pressing for changes in government responses after the tsunami in 2004;
- Trust and capacity built up thorough previous community and network activity enabled the network to launch a highly effective and immediate response;
- Local NGOs coming together and working through local networks is an efficient and cost-effective way to address local crises;
- Use of similar existing networks could be employed elsewhere in disaster risk management activities;
- The local NGO network had existing communication and advocacy experience and were able to ensure all affected groups were provided with assistance, to focus on rehabilitation for those most in need – often tribal peoples and also women who did not receive much in the way of main government aid; and
- Characteristics of the networks were – shared leadership and a decentralised approach encouraging flexibility and innovation whilst at the same time incorporating common systems within this decentralisation, enabling rapid collaboration and coordination during a period of crisis.

Issues associated with implementation

NGOs are generally poor at networking and joint advocacy and funding programmes may be required to build trust and joint working.

Local networks need to be identified and encouraged without being ‘managed’ from outside.

Further information

Patrick Kilby (2008) The strength of networks: the local NGO response to the tsunami in India Disasters 32 (1), 120–130

Global NHRM Good Practice Case Study 17: USA

Good practice identified

Early warning disaster response capacity in the tourism sector needs support from residents, staff and visitors in terms of their response to the warning. This study evaluates the role of staff training for emergencies, emergency management exercises (drills and evacuation), within motels and hotels in Washington State, USA, in order for early warnings to be of use in reducing the impacts of a tsunami.

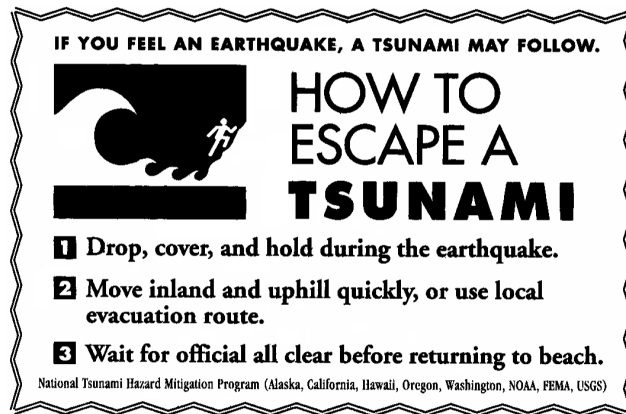
Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Mitigation Preparedness Response Recovery	Washington State, West coast USA	Tsunami	Tourism

Level of implementation

Operational – hotels and motels

Innovative perspectives and transferable practices

- For a natural hazard warning system to be effective, staff response and training must be improved in order to enhance the utility of early warning and notification, through processes of response planning, discussion and communication, education, training and signage, simulation exercises, to improve organisational and community resilience;
- Employee training on how to respond to warnings is identified as a key issue, and is often a cost effective way of improving warning response effectiveness;
- Emergency management training should be an essential component of new employee orientation /induction training;
- Establishing dialogue with the tourism sector, and encouraging businesses to integrate emergency preparedness as a core activity are keys to addressing and overcoming challenges in this sector;
- Key stakeholders in the tourism sector need to be identified, along with decision-making procedures, and communication channels, relationships developed across the sector, and key resources identified;
- Training needs assessment and awareness-raising workshops with key tourism and accommodation managers are identified as one means of accessing the sector;
- Key areas for 'on-the-ground' personnel are - understanding the hazards, vulnerability and risk; emergency planning issues; individual and organizational strengths and weaknesses; barriers to implementing mitigation; and ways to overcome negative impacts of false alarms; and
- The benefits of well trained staff need to be highlighted in light of the financial implications of training.



Issues associated with implementation

Larger hotels already had orientation or general training programmes set up which had the potential to incorporate future tsunami and hazard training, while smaller “owner-operator” businesses did not, and this group were difficult to access.

Organisations often leave training modules on the periphery of Occupational Health and Safety standards in order to trim short term costs and staff are left vulnerable and ignorant of important information that is essential to meet the demands of a tsunami crisis.

Staff turnover is high so training has to be repeated frequently.

Further information

Johnston, D., Becker, J., Gregg, C., Houghton, B., Paton, D., Leonard, G., Garside, R. (2007) Developing warning and disaster response capacity in the tourism sector in coastal Washington, USA *Disaster Prevention and management*, 16(2) 210-216

Global NHRM Good Practice Case Study 18: India

Good practice identified

Micro-insurance scheme for disaster preparedness programme - in India's coastal Andhra Pradesh region, microinsurance services are provided since 2004 as part of the region's disaster preparedness program. Life insurance policies that include natural disaster risks are offered to vulnerable families by the Oriental Insurance Company, a profit-oriented, but publicly owned insurer. Coverage for risks of floods, landslide, rockslide, earthquakes, cyclone, and other natural calamities is available to groups of women in the age of 15–75 years and with a minimum size of 250 members.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Mitigation Risk Transfer	India	All hazards	All sectors

Level of implementation

Tactical and operational – NGO and private sector businesses, community and volunteer groups

Innovative perspectives and transferable practices

- Insurance premiums are kept low by offering only minimal cover and dealing with organized women groups, thus limiting transaction costs;
- Subsidies assist start up costs - Oxfam UK paid 50% of the premium in the first year and formal insurance providers have to service the poor through regulations focused on increasing access to low-income clients – many businesses incur losses on their low-income microinsurance business in order to be allowed access the wider market. Insurers therefore make such insurance affordable to poor communities through cross subsidies from other lines of business from higher income clients; and
- Additional support is provided by trained village disaster management volunteers, who act as insurance agents by carrying out contract preparation and claims handling, so lowering transaction costs even further.

Issues associated with implementation

This has been a small and localized pilot scheme and there have been no major catastrophes in the insured region.

Any degree of 'scaling up' would require more backup capital or reinsurance.

Further information

Linnerooth-Bayer, J., Mechler, R (2007). 'Disaster safety nets for developing countries: Extending public-private partnerships' *Environmental hazards* 7(1) 54-61

Global NHRM Good Practice Case Study 19: Asia / Pacific

Good practice identified

Post-disaster recovery of tourism industry initiated by regional tourism bodies - the Pacific Asia Travel Association (PATA) present updates and information on destinations in the region post-disaster

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Recovery - rehabilitation	Asia/Pacific	All hazards	Tourism

Level of implementation

Tactical, operational

Innovative perspectives and transferable practices

- PATA monitors the post-disaster situation through its local members and maintains updates on its website to inform current visitors and future travellers;
- It provides audio and visual access to local people and their experiences;
- It encourages tourists back to the region as part of the recovery process; and
- It identifies areas which are unsuitable for visiting but also emphasizes when and where other areas which are open and accessible as usual.

Issues associated with implementation

None identified

Further information

Pacific Asia Travel Association

<http://www.pata.org/patasite/index.php?id=1804>

Global NHRM Good Practice Case Study 20: India

Good practice identified

The Development of Humane Action (DHAN) Foundation (www.dhan.org) helps disadvantaged people organize community groups for risk management purposes. DHAN provides a variety of programs and services for its members, including financial services like micro-insurance to insure members against natural hazards. As a local NGO in India, DHAN has the relationships with communities groups to set up risk management schemes for almost 15,000 community groups, called Kalanjams, which comprise smaller units of 15–20 poor women. Through these units, the DHAN Foundation reached over 250,000 families in India.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Mitigation Risk Transfer	India	All hazards	All sectors

Level of implementation

Tactical and operational – NGO and local community groups

Innovative perspectives and transferable practices

- NGO may require specialist financial backing and expertise regarding financial services for improved risk management;
- The loan scheme required the input of reinsurance facilities and negotiation with local insurers to ensure the high volume of loans could be serviced;
- The partnership with the reinsurer was facilitated through the Micro-Insurance Association Netherlands, which offered specialist expertise on financial service products, technical support for claims administration and training programs to develop local insurance capacity, and community education programs;
- NGOs can help private financial services companies overcome obstacles such as lack of access to groups in need and awareness of financial services, illiteracy, and articulation of concepts and benefits;
- The NGO involved developed street plays to illustrate to spectators how micro-insurance schemes help solving problems relating to disasters; and
- Information shared via these routes has proved effective in increasing understanding and demand for micro-insurance.

Issues associated with implementation

Requires high level input from financial services specialists

Further information

Warner, K., Bouwer, L., Ammann, W., (2007). 'Financial services and disaster risk finance: Examples from the community level'. *Environmental hazards* 7(1) 32-39.

Development of Humane Action (DHAN) Foundation www.dhan.org

Micro-Insurance Association Netherlands www.mian.nl

Caribbean Case Studies of Good Practice in NHRM

The case studies presented here for the Caribbean region draw evidence from members of Caribbean regional institutions and organizations, such as CARICOM as well as including activities from members of wider associations which incorporate Caribbean interests, such as members of the Association of Caribbean States (ACS) which cover island states in the Caribbean but also states in Central America which provide relevant regional learning experiences.

Caribbean Regional NHRM Good Practice Case Study 1: Central America

Good practice identified

Community-based DRM: experience gained in Central America: a project facilitating wide community participation in disaster risk management

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk mitigation Preparedness Response	Central America	Multi-hazard	All sectors

Level of implementation

Tactical

Operational

Innovative perspectives and transferable practices

- Community-based DRM focus;
- Decentralizing national systems and mainstreaming DRM at local level;
- Local capacity building and participatory activity for short-term (emergency planning) and long term (e.g. land use planning) activities;
- Community-specific, participatory awareness-raising, information provision, capacity-building activities;
- Strong interfaces with national frameworks (e.g. local enforcement of national planning legislation);
- Supports integration and mainstreaming of DRM across sectors, levels and institutions; and
- Reduces perception of disaster-affected population as passive victims, unable to prepare for events and to respond until outside assistance arrives.

Issues associated with implementation

Perceived cost – in time and personnel.

Few cost-benefit analyses conducted to indicate benefits of CB-DRM.

Requires openness to decentralization and democratization of policy, planning and implementation.

Further information

Bollin, C. 2003. *Community-based disaster risk management; Experience gained in Central America*
<http://www.gtz.de/de/dokumente/en-community-based-drm.pdf>

Caribbean Regional NHRM Good Practice Case Study 2: Belize

Good practice identified

Mitigating hazard Impacts in the Caribbean - the Belize National Emergency Management Organization has enacted a National Hurricane Preparedness Plan which is updated annually a before the start of the hurricane season incorporating simulation and learning activities.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk mitigation Preparedness Response Recovery	Belize	Hurricane, storms, floods	Tourism, all sectors

Level of implementation

Strategic, Tactical Operational

Innovative perspectives and transferable practices

- Senior ministerial commitment through the prime Minister and ten operational committees and the Meteorological office;
- Incorporating representatives from the Red Cross, Armed Forces, Teaching and Medical associations, who are perceived of as being trustworthy and responsible by the general public;
- The national groups link closely with district emergency committees;
- The tourist board regulates activities of the accommodation sector, tour operators and vessels and tie these regulations to conforming to the National Emergency Plan;
- Employees of the tourist board are trained to act in the event of an emergency to visit affected areas and assist with planning response, insurance claims and recovery activities preferably in person;
- The tourist board evaluators assess the extent of damage e.g. hotels or rooms unavailable, estimated costs and timescales until they are available for use, damage to infrastructure or tourist attractions; and
- The tourist board is also responsible to aiding recovery and rehabilitation of the tourist industry through marketing an public relations in source markets.

Issues associated with implementation

Requires close collaboration across sectors.

Further information

Belize Tourism Board, P.O. Box 325, 64 Regent Street, Belize City, Belize

www.travelbelize.org

Caribbean Regional NHRM Good Practice Case Study 3: Bahamas

Good practice identified

NEMA National Disaster Plan - the development of an island-wide emergency response plan.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk mitigation Preparedness Response Recovery	Bahamas	Multi-hazard	All sectors

Level of implementation

Strategic

Innovative perspectives and transferable practices

- National Disaster Plan establishes systematic protocols for implementation in event of major disasters, coordinating resources from all sectors before, during and after an emergency;
- Identifies emergency support functions (e.g. communications, transport, public works & engineering, planning & information, health, search & rescue, tourism) and lead agencies for each function, facilitating effective disaster response by grouping agencies/organizations into functional areas; and
- Provides a focus of interagency and intergovernmental working.

Issues associated with implementation

Requires high level inter-organization and multi-sectoral planning.

Further information

The National Emergency Management Agency (NEMA)

<http://www.caribbeanredcross.org/what/dm/ccws-ppt/nema-bah.pdf>

Caribbean Regional NHRM Good Practice Case Study 4: The Bahamas

Good practice identified

Hurricane Preparedness & Response Plan – Tourism & Aviation: the development of the NEMA emergency response for the Tourism and Aviation sectors. MOTA is lead agency in emergency support function #12 (Tourism & Aviation) in NEMA National Disaster Plan, charged with responsibility for ensuring that the sector is equipped to respond and recover from the impacts of a major hurricane.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness Response	Bahamas	Hurricane	Tourism & Aviation

Level of implementation

Strategic

Innovative perspectives and transferable practices

- Identification of primary lead for the sector, aiming to protect tourists, businesses, destinations and tourism product through e.g. development of evacuation and coordination plans at destination/hotel level, protection of the image and reputation of The Bahamas during and after a crisis.

Issues associated with implementation

Requires close inter-organization and multi-sectoral working.

Further information

Ministry of Tourism & Aviation; Hurricane Preparedness & Response, personal communication

Caribbean Regional NHRM Good Practice Case Study 5: Greater Caribbean

Good practice identified

Hurricane cover and encouraging visitors in traditionally less popular periods - the initiation of innovative financial and other programmes to sustain visitor demand at risk from hurricane and heat extremes.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Recovery - rehabilitation	Caribbean & Gulf of Mexico	Hurricane, Heatwaves	Tourism

Level of implementation

Strategic

Tactical

Operational

Innovative perspectives and transferable practices

- Innovative marketing of destinations as four-season destinations targeting honeymoon market and budget-conscious families;
- Downplaying the region's summer heat and offering upgraded air-conditioning, discounted room rates, to cover to increase visitor numbers during the traditionally quieter periods; and
- Provision of hurricane guarantees or waivers offering e.g. replacement value stay in the event of hurricane event.

Issues associated with implementation

Cost of large-scale advertising and insurance cover - Florida allocated US\$30 million to 'hurricane recovery' marketing following the devastating sequence of four hurricanes in 2004 and developed a weather insurance program for convention organizers, where it pays the premiums for US\$200,000 insurance coverage for rescheduling costs associated with hurricane disruption.

Further information

Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. and Gladin, E. (2008) Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices. UNEP, University of Oxford, UNWTO, WMO: Paris, France.

<http://www.unep.fr/shared/publications/pdf/DTI1x1047xPA-ClimateChange.pdf>

Caribbean Regional NHRM Good Practice Case Study 6: Dominican Republic

Good practice identified

Disaster Risk Coping Mechanisms - the development of local community risk plans based on learning from previous disasters and focusing on enhancing capacity from within local communities.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Identification, Risk Mitigation, Risk Transfer Preparedness Response	Dominican Republic	Hurricane	Tourism, All sectors

Level of implementation

Strategic, Tactical, Operational – Government, The Puerto Rico offices of the US National Weather Service (NWS) and the US Federal Emergency Management Agency (FEMA), Local Red Cross, Civil Defence, and National Meteorology Office (ONM)

Innovative perspectives and transferable practices

- Pre-Hurricane Georges in 1998 *Asociacion Dominicana de Mitigacion de Desastres* (ADMD) and a coalition of NGOs championed disaster preparedness and prevention among vulnerable communities, conducting workshops in over 700 communities;
- Local participants prepared community emergency plans building on assessments of local hazard vulnerabilities and locally available resources. Communities with established emergency committees successfully evacuated people from flood prone areas, established shelters, organized clean-up brigades, and requested and distributed assistance;
- Communities identified and implemented small risk reduction projects and actions, e.g. construction of containment walls and drainage ditches addressing local environmental and health concerns, reducing floods and landslides; the positive effect of these initiatives was demonstrated by the reduced impact of Hurricane Georges on the participating communities;
- Post-Hurricane George the Government created a ‘Solidarity Fund for Reconstruction’, to pool emergency resources from state, public, private donors, and loans;
- Shortcomings in previous emergency management had been recognized and this aimed to restructure the institutions responsible for disaster management; and
- Main aims - specialized early warning equipment; technical and logistical emergency support; training for national-level ONM staff in disaster preparedness, and local staff in helping local governments and rural communities to prepare for and respond to emergencies.

Issues associated with implementation

Requires a commitment for reviewing and evaluating DRM activities from previous disasters

Further information

Natural HRM in the Caribbean Hurricane Georges Emergency Recovery Project, World Bank, 2002

http://www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2002/09/07/000094946_0208220410383/Rendered/PDF/multi0page.pdf

Caribbean Regional NHRM Good Practice Case Study 7: British Virgin Islands

Good practice identified

New approaches to Hazard Risk Management - Hurricane Hugo had a traumatic impact on the physical and socio-economic fabric of the BVI in September 1989. Losses amounted to US\$40 million and 30 per cent of the country's housing stock was destroyed. This event was a catalyst for introduction of an administrative, operational and policy framework to reduce the impacts of future hazard events. In response, the Government recruited regional disaster management professionals for advice on how best to strengthen the country's technical capacity for disaster management.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Identification, Risk Mitigation, Risk Transfer Preparedness Response	British Virgin Islands (BVI)	Hurricane	All sectors

Level of implementation

Strategic, Tactical, Operational – Government, US National Weather Service (NWS) & Federal Emergency Management Agency (FEMA), Red Cross, Civil Defence, National Meteorology Office

Innovative perspectives and transferable practices

- Post-event learning is essential - post-Hurricane Hugo assessment changed traditional approach to disaster management, from response and recovery to risk assessment, mitigation and preparedness. Government measures involved environmental assessments, hazard risk assessments, new building and land use regulations and standards;
- Disaster and hazard risk management benefited from strong political and financial support;
- Public awareness / education is essential for effective disaster management, requires an aggressive approach from those working in education activities. A high level of consciousness among residents resulted in greater acceptance of e.g. the need to adopt appropriate hazard resistant construction techniques, to build hurricane shutters into all new buildings etc.;
- Integrated approaches to disaster management at the institutional level were necessary, involving collaboration between Physical Planning Department, Development Planning Unit and the Department of Disaster Management with resulted in a framework for incorporating disaster and hazard risk management into physical and economic planning; and
- Innovative financing was necessary e.g. the disaster office provided direct budget assistance to other sectors in the development of hazard contingency plans; material for hurricane shelters were made exempt from tax and grants were made available.

Issues associated with implementation

Systemic cultural changes within all sectors of government are required.

Further information

Natural HRM in the Caribbean Hurricane Georges Emergency Recovery Project, World Bank, 2002.

http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2002/09/07/000094946_0208220410383/Rendered/PDF/multi0page.pdf

Caribbean Regional NHRM Good Practice Case Study 8: Caribbean Region

Good practice identified

Disaster Information Kit for the Media - the development of an information resource to inform the media about natural hazards and disaster risk management.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness Response	Caribbean region	All hazards	Tourism, all sectors

Level of implementation

Operational

Innovative perspectives and transferable practices

- The provision of an easily accessible source of background information on disasters for media practitioners in the Caribbean should ensure greater consistency in interpretation and reporting of basic disaster information by media practitioners across the Caribbean;
- The kit will alleviate the pressure placed on disaster management officials during emergencies by the need to constantly explain basic concepts, terminology, and practices to the media;
- The role of the media in during disaster events is vital and providing a high quality resource demonstrates recognition of this and should enable the media to better fulfil this role; and
- The kit highlights the benefits of a good working relationship with the media and a commitment to cooperation and collaboration between media and disaster management professionals.

Issues associated with implementation

Information kit needs to be update regularly as risk and processes change, and outdated information may be detrimental.

Further information

Disaster Information Kit for the Caribbean Media, CDERA

http://www.cdera.org/doccentre/publications/Media_Kit_Ver06_2004_v3.pdf

Disaster Information Kit for the Caribbean Media, UNESCO

http://portal.unesco.org/es/ev.php-URL_ID=29007&URL_DO=DO_TOPIC&URL_SECTION=201.html

Caribbean Regional NHRM Good Practice Case Study 9: St Lucia

Good practice identified

Hurricane-Resistant Home Improvement Program in St. Lucia - a charity in St. Lucia, the National Research and Development Foundation (NRDF) established a program to make low-income housing in the Eastern Caribbean safer and more environmentally sustainable through property insurance and a home retrofit programme.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Transfer	St Lucia	Hurricane	All sectors

Level of implementation

Tactical, Operational

Innovative perspectives and transferable practices

- In the context of CDM, the location and construction of homes are vital to ensuring safety during extreme events, but with few resources available to rebuild or repair houses affected by natural or other hazards, or to improve homes prior to such events, damage to or loss of a home can leave a family homeless, out of work and in financial peril;
- Loan funding is made available to low-income homeowners who would otherwise not have access to mortgage funds and is focused on improving and retrofitting homes to make them more resistant to the effects of tropical storms; and
- Low-income residents in low-quality housing rarely have access to insurance to cover losses. By making homes stronger, these properties become a more attractive risk to property insurers and all recipients of home improvement/retrofit loans are required to purchase insurance under the group plan. Retrofitting is thus a cost of access to insurance made available via arrangements associated with the loan facility.

Issues associated with implementation

Initiating loan schemes requires capital investment in uncertain markets.

Loans schemes need to be sustainable to ensure ongoing, long-term improvement.

Well trained staff needed 'on-the-ground' for loan and insurance assessments.

Further information

Tomlin, W., Moore, R., Stenhouse, R., Kaloumaira, A., Nakalevu, T., Mace, M. (2004). Insurance, Climate-Related Events and Risk Management in the Caribbean and Pacific <http://www.field.org.uk/PDF/UNDP%20Insurance%20Paper%20March%202004%20%20Ins.%20and%20Risk%20Management.1.pdf>

Caribbean Regional NHRM Good Practice Case Study 10: Cayman Islands

Good practice identified

Disaster Risk Communications Flow Chart - the Cayman Islands developed a framework for managing communications during a hurricane threat.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk Mitigation Preparedness Response Recovery	Cayman Islands	Hurricane	Tourism

Level of implementation

Strategic, tactical, operational

Innovative perspectives and transferable practices

- The communications strategy was developed incorporating national and regional partners as well as departments of Tourism, Finance and media organisations;
- Teams were designated to particular communication roles;
- International team works to manage the international image and disseminate timely and accurate information with sensitivity to unique industry issues, line with Cayman Island objectives as approved by the higher management committees;
- Domestic team prepare and disseminate local news about the disaster, and facilitate local/overseas media reporting as required;
- Overseas Partner team Teams liaise with overseas partners in aviation, accommodation and tour operators and regional associations to receive email update of local situation 2 or 3 times a day;
- Domestic Private Sector Teams liaise with domestic operations and associations, accommodation managers, tourism transport managers and provide update information via email 2-3 times a day; and
- Additional communications routed through links with radio and television channels.

Issues associated with implementation

Requires advance planning and coordination to roles.

Further information

Ministry of Tourism, Environment, Investment and Commerce, 4th Floor, Gov't Admin Bldg, Grand Cayman, Cayman Islands

Caribbean Regional NHRM Good Practice Case Study 11: Grenada

Good practice identified

Mainstreaming Risk Reduction - after Hurricane Ivan in September of 2004, approximately 80 percent of the structures on the Island were damaged or destroyed. Grenada is an important tourism destination in the Eastern Caribbean and a number of resorts were extensively damaged or destroyed by Ivan's high winds and storm surge.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk mitigation	Grenada	Hurricane	All sectors

Level of implementation

Strategic

Innovative perspectives and transferable practices

- National risk reduction initiative in Grenada involved hazard mapping and conducting vulnerability assessments, and development of a national risk reduction policy and plan documents;
- A legislative review and institutional capability assessment for risk reduction was conducted to ascertain existing and required measures;
- Major findings of the assessment included: the need to formalize the role of the redevelopment authority for future events, to enact comprehensive disaster management legislation; strengthen building codes; providing tools and mechanisms for integrating risk reduction into the development review and physical planning functions; and
- The quality of construction is much higher and more disaster resistant since Hurricane Ivan, particularly in the public formal sectors.

Issues associated with implementation

There has been less success in improving building quality in the informal sector as owners and builders continue to build non-reinforced structures.

The challenge will be to sustain these risk reduction initiatives over the long term.

Further information

UNEP (2008) *Disaster Risk Management for Coastal Tourism destination: Responding to Climate Change – A Practical Guide for Decision-makers* – in preparation

Caribbean Regional NHRM Good Practice Case Study 12: Caribbean Region

Good practice identified

Radio Soap Opera on Natural Disasters in the Caribbean: a public service broadcasting initiative aiming to improve disaster preparedness through “educative theatre” techniques, comprising 15 episodes of 10-minute broadcasts.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness	Caribbean region	All hazards	All sectors

Level of implementation

Strategic, Tactical, Operational – involvement of Red Cross, UN International Strategy for Disaster Reduction (ISDR), Pan-American Health Organisation (PAHO), Caribbean Development Bank (CDB) and the ACS

Innovative perspectives and transferable practices

- It has been acknowledged that better disaster preparedness on the part of the public in general would reduce the impact of disasters;
- The Radio Soap Opera will be used as a forum for sharing and disseminating information pertaining to disaster management; and
- This approach may reach sections of the community who would otherwise not engage with formal disaster risk management activities.

Issues associated with implementation

Requires collaboration with media/broadcast organizations.
The study has not yet been fully evaluation.

Further information

Natural Disaster projects developed by the ACS:
<http://www.acs-aec.org/projects/projects.htm#ProjectsND>

Caribbean Regional NHRM Good Practice Case Study 13: Barbados

Good practice identified

Barbados have initiated a process of 'Disaster Planning for the Tourism Sector' which identify disaster management, threat identification and risk standards for the tourism sector within the context of a Sustainable Tourism Policy, involving an comprehensive information management system.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Risk identification Risk Mitigation Preparedness	Barbados	All hazards	Tourism

Level of implementation

Strategic, Tactical

Innovative perspectives and transferable practices

- Identifies the unique characteristics of the Barbados tourism product and aligns CDM planning to support this;
- Facilitates a standardised format for the collection of DRM data and facilitates centralisation and sharing of this data;
- Establishes a system for the regular and ongoing update of data sets and requires back-ups to be located at secure location off-site;
- Facilitates the creation of information which depicts vulnerability to different scenarios;
- Allows for vulnerable areas, communities and populations to be identified and mapped;
- Takes into account the breadth of the tourism product;
- Identifies the location of vulnerable tourism locations and infrastructure;
- Allows for the calculation of economic losses due to an impact;
- Ensures that building standards / codes address identified threats;
- Identifies critical infrastructure and superstructure; and
- Identifies and maps important environmental resources.

Issues associated with implementation

Requires long-term perspectives on CDM, and appropriate planning.

Further information

Ministry of Tourism, Sherbourne Conference Centre, Two Mile Hill, St. Michael, BB11093, Barbados West Indies <http://www.barmot.gov.bb/>

Caribbean Regional NHRM Good Practice Case Study 14: Jamaica

Good practice identified

Tourism Emergency Operations Centre (TEOC) protocol has been established by Office of Disaster Preparedness and Emergency Management (OPDEM) and CTO, in combination with a Hurricane Procedures Manual to train relevant stakeholders to deal with hurricane threats and impacts.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness Response Recovery – rehabilitation and reconstruction	Jamaica	Hurricanes, hazards	All Tourism

Level of implementation

Strategic, tactical, operational - Ministry of Tourism, Entertainment and Culture; Tourism Product and Development Company, Tourist Board, Media representatives, Emergency and security services, Tourism Liaison Officers, Hotel and Tourist Association, Representatives from accommodation, vessel transport, Parish disaster committee representatives.

Innovative perspectives and transferable practices

- Developed disaster response and control plans and facilitated centralised emergency procedures;
- Identified communications protocols through OPDEM and other public and private organizations and identified strategies which could be implemented to respond the immediate emergency as well as recovery
- Applicable to accommodation facilities c. over 100 rooms;
- Activated at onset of hazard at central facility where communications headquarters established responsible for information dissemination;
- OPDEM provides additional assistance on website e.g. lists local disaster representatives, location of shelters; and
- Streamlined press releases and minimize dislocation after impact.

Issues associated with implementation

Requires training of key personnel and representation within each location to liaise between operational facilities and on-the-ground situations, and other stakeholders during an emergency
Requires support from tourist sector associations and organizations if the plan is to work effectively
Commitment needs to be ongoing, not just at inception.

Other states that have implemented TEOCs include Barbados and The Maldives.

Further information

Office of Disaster Preparedness and Emergency Management (OPDEM).

http://www.odpem.org.jm/about_us/index.html

Jamaica Tourist Board

http://www.jis.gov.jm/indus_tourism/html/20070818T150000-0500_12763_JIS_MINISTRY_OF_TOURISM_ENTERTAINMENT_AND_CULTURE_ADVISORY.aSP

Caribbean Regional NHRM Good Practice Case Study 15: Jamaica

Good practice identified

A hurricane plan has been developed by the Hilton International Hotel, Kingston in conjunction with the Tourism Ministry and the OPDEM and the Jamaica Hotels Association.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Preparedness Response	Kingston, Jamaica	Hurricane, Flood	Tourism

Level of implementation

Operational – mid-large hotel facilities

Innovative perspectives and transferable practices

- A formal plan to direct operations in the case of a hurricane identifying key tasks of hotel personnel and logistical support;
- Guests are informed about potential threats and provided with instructions in advance of what they should do;
- Rooms allocated to emergency functions (communications, medical, food supplies);
- Frozen food used first to avoid spoilage and secure longer term supplies;
- Shuttering of windows;
- Emergency manager to allocate duties to on-duty staff and prepare evaluation plans;
- Non-essential personal sent to safety;
- Communication channels established to local, national media and emergency response authorities, plus in house video to inform guests throughout facility;
- Plans established to cover in case of power/communications failure;
- Storage of all movable items through facility e.g. pool furniture to minimize damage;
- Reduce swimming pool water by 16 inches and use supply for emergency drinking water; and
- Post-impact assessment including photographing and communicating damage to authorities to speed up start of recovery.

Issues associated with implementation

Requires emergency resources to be available at short notice (e.g. lighting, medical facilities, emergency food and water supplies) and regularly replenished.

Further information

Office of Disaster Preparedness and Emergency Management
<http://www.odpem.org.jm/sitemap.htm>

Caribbean Regional NHRM Good Practice Case Study 16: Grenada

Good practice identified

Thirty Day Cruise Ship Recovery Plan – the Ministry of Tourism have initiated a plan to facilitate the recovery of the Cruise Ship Industry after a hurricane or other hazard impact affecting the Cruise Ship sub-sector and related facilities such as attractions.

Main CDM phase(s) enacted	Location / Destination(s)	Natural Hazard	Sector Relevance
Response Recovery - rehabilitation	Grenada	Hurricane, hazards	all Tourism

Level of implementation

Strategic, tactical - Ministry of Tourism; Ministry of Finance; Forestry Department; Police Department; National Disaster Management Agency; Ministry of Agriculture; Ministry of Transportation; Social Development Agency; Insurance Companies; Agency for Reconstruction and Development, Public utilities

Innovative perspectives and transferable practices

- Cruise Ship sub-sector prioritised over 'stay over' sector as the latter would involve large capital outlay and more time to recover;
- Tourism Task Force established after Hurricane Ivan, and given 30 days to have Cruise Ship sector back on track;
- Minister visited and lobbied Florida-based Cruise shipping interest to keep Grenada on the grid;
- Multiple communications protocols established between teams within the task force;
- In addition to rebuilding of cruise ship pier, priority was given to the rehabilitation of public attractions as well as some popular private attractions such as Grand Etang Crater Lake and financial assistance was negotiated to assist in the recovery of such facilities;
- Access to the rebuilt cruise ship pier would be allowed only to certified tour operators. This led to greater certification in the industry and the delivery of a better product than before the hurricane impact;
- Certification of re-built attractions was established as a quality assurance strategy;
- Craft vendors given a grant of EC\$500 to assist in the recovery of their business, dependant on their attending training sessions on courtesy, quality service etc.;
- The plan focused on ensuring visitors has a 'red carpet experience when the first cruise ship arrived, with live entertainment etc.;
- Survey questionnaire administered to visitors to ascertain their perspectives of the experience post-disaster; and
- Action aimed to improve on pre-impact services and infrastructure, seeing the event as an opportunity not just a disaster.

Issues associated with implementation

Required skilled builders, etc to work on rapid re-construction of harbour infrastructure and attractions as the aim was not to replace but to improve; certification administration required.

Required skilled leadership to motivate and coordinate different sectors.

Funding is required – post Ivan action was funded by the European Union.

Further information

Grenade Tourism Information: <http://www.grenadagrenadines.com/press.html?id=68>

Central Themes identified as being important to Good Practice in CDM in the Tourism Sector

Many of the case studies identified within this document, whilst general in nature, highlight issues for CDM within the context of the tourism sector. There are several themes which emerge from the case studies identified:

1. Mainstreaming

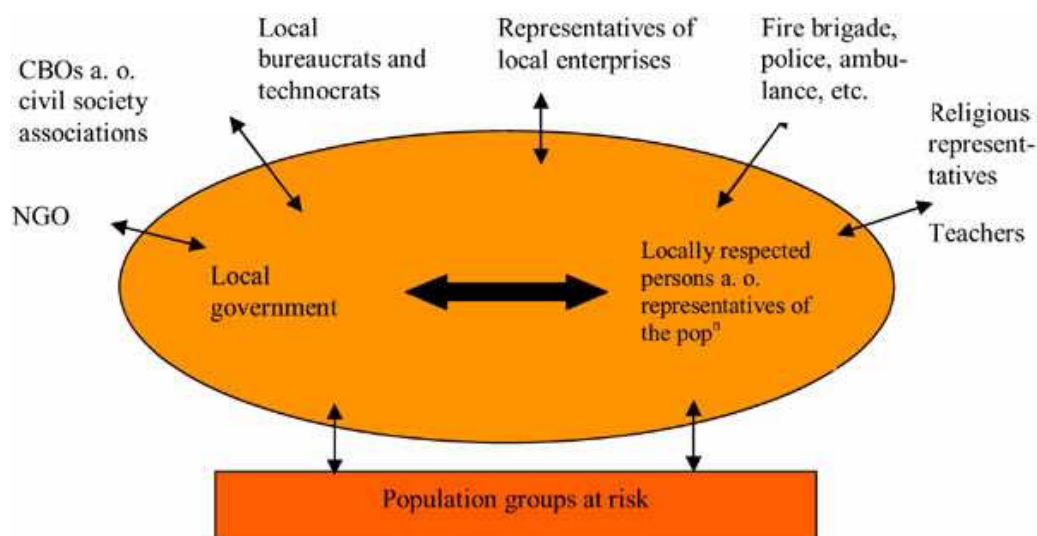
There is a clear recognition of the need for mainstreaming CDM so that it is assimilated into wider planning and development activities. Reducing vulnerability and increasing capacity is at the heart of CDM and is necessary in order to cope with repeated losses – multi hazard, island, year, multiple impacts. Disasters impact on development potential and good CDM practices will help retain funding for development as opposed to ploughing it back into reconstruction after a natural disaster. This requires systemic changes in that disaster risk and hazard concepts need to be incorporated into existing frameworks, e.g. in development planning, livelihoods, infrastructure design and maintenance, development and location of capital project, building standards.

Case study 5: India is an example of a programme aiming to mainstream the development of Disaster Management Plans across state, district and community levels. In addition, Caribbean case study 7: British Virgin Islands indicates a learning and assessment response to a previous disaster event (Hurricane Hugo) by wide-scale changes to administrative, operational and policy and technical frameworks aiming to reduce the impacts of future hazard events. Caribbean case study 11: Grenada focuses on mainstreaming disaster risk management through involving all-sector awareness/preparation/enforcement and capacity-building programmes.

2. Community awareness-raising and involvement

The importance of community awareness, preparation and planning is a central theme throughout much of the DRM literature. Community participation is essential to sustained success; communities need to take ownership of their disaster risk and be empowered to act and to become resilient. Community-based approaches are an effective and valuable tool for the success of comprehensive and integrated approaches risk management and community activity can include risk identification and surveillance, emergency response and recovery activities. Education and awareness-raising is essential to ensure disaster resilient communities.

Figure 4: Local actors in disaster prevention (source - Bollin 2003)



Case study 2: Vietnam is an example of a highly focused project raising awareness of risks and management strategies in order to develop disaster-resilient communities. It incorporates community-based management plans within wider development activities, highlighting the importance of self-help and locally-appropriate planning, developing ‘social capital’ and incorporating local knowledge into management and planning. Case study 7: Japan focuses on disaster planning and preparedness across residential areas and case study 8: Sri Lanka focused on building capacity and developing resilience through community level initiatives. Caribbean case study 6: Dominican Republic facilitates community learning from previous disasters in order to build local capacity within affected communities. In terms of building partnerships within and between community groups, case study 9: Philippines indicates a series of programmes integrating community disaster planning and knowledge sharing between communities facing similar risks and case study 16: India focuses on encouraging the development of networks of community groups and local NGO’s to promote specifically local responses.

3. Cross-scale and multi-sector collaboration and capacity-building

Multi-sector collaboration is essential for successful disaster risk management, as many of the necessary strategies for risk management relate to multiple sectors and scales requiring interdisciplinary approaches which cannot be left to any one sector or industry. In addition, capacity-building is necessary at local, regional and national levels in order to ensure that risk management activities are planned and implemented as effectively as possible.

Case Study 1: Indonesia highlights the important role of capacity-building at all levels in the context of developing a National Disaster Management Bill involving government bodies, NGO's and local communities and institutions. Collaboration through multi-scales/sector partnerships and networking encourages awareness-raising and information sharing to strengthen co-ordinated risk management activities. Case Study 3: Netherlands again raises the importance of strong multi-level governance in raising community and institutional resilience against risk. The initiative emphasises the need for incorporating and integrating multiple knowledge sources (e.g. scientific and local knowledge) in order to legitimize activity at all levels.

In terms of Caribbean activity, the two Caribbean case studies 2: Belize and 3: Bahamas involve the development of National Disaster Plans with overarching top-level management and focused sub-sectoral and cross-sectoral working throughout.

4. Sector (or risk) -specific activity

Whilst recognising the importance of cross-sector strategies, sector-specific planning is also required in order to ensure each sector has the capacity to manage the specific risks natural disasters present, e.g. tourism, agriculture, utilities, communication and transport infrastructures.

For example, the tourist industry has to deal with non-local populations and infrastructure requirements that present problems and require responses, which are highly specific to the sector. In case study 10: Mozambique, options considered for building new sea defences recognized the need to retain and potentially enhance the tourist infrastructure and attractions for future tourism activity, rather than utilize alternatives that, whilst meeting the requirements of defence, might negatively impact on the future tourist potential of the region. In case study 15: Kenya, the planting of mangroves in coastal zones, aimed at providing sea defences for local communities, has had the added benefit of providing a wildlife conservation-based tourist attraction which helps to sustain the local economy. In addition in case study 11: Fiji, specific and strongly enforced building codes have been established for tourist areas and tourist locations have to develop disaster management plans for each season. In case study 12: India and Thailand, the APELL process has been specifically established in the tourism sector to raise awareness in tourism destinations badly affected by the 2004 Tsunami and case study 17: USA indicates a similar aim to enhance awareness and plan responses specifically within the tourism sector, with relatively little cross-sector activity.

In contrast, case study 13: Maldives, explores a strong sub-sector activity within cross-sector framework: a generic 'Safe Islands' post-tsunami risk management plan has a major sub-section specifically focused on the tourism industry involving island-wide organizations and businesses.

Similarly, in the National Disaster Plan for Hurricane Preparedness & Response in the Bahamas (Caribbean case study 4), there is a designated programme for the tourism and aviation sector. In Caribbean case study 13: Barbados, a 'Disaster Planning for the Tourism Sector' indicative has been instigated assessing specific tourist-related risks and responses within the context of a sustainable tourism policy and in Jamaica (14, 15) emergency response plans have been instigated involving training programmes for tourism-specific stakeholders.

Several case studies highlight activities aimed at managing tourist-related risks during disaster events as well as managing post-event tourism industry recovery, e.g. case study 19: Asia/Pacific and Caribbean case study 5: Greater Caribbean focus both on direct risk management and communication during an event as well as a more wide scale but still sector-specific initiative aiming to re-establish the tourism credentials of the region afterwards. In contrast, Caribbean case study 10: Grand Cayman is a very sector- and action-specific project aiming at improving tourism communications processes during a hurricane and Caribbean case study 8 has developed a 'Disaster Information Kit' to provide the media with generic information about risks and management strategies and specific information about how the media can help during a disaster event. Caribbean case study 16: Grenada provides another example of highly specific responses to disaster risk, a plan to facilitate the recovery of the cruise ship industry after a hurricane.

Case study 4: Armenia is an example of a highly focused single sector activity outside of the tourism industry, raising awareness in school children as to the risks and practical management of disasters through child-friendly school-based activities. Specific risks are also addressed in many examples, e.g. case study 6: Indonesia where a mitigation framework for coping with landslide hazards has been developed.

5. Finance, insurance and other risk transfer schemes

Innovative financing strategies and risk transfer measures are one approach to enhancing resilience in regions where disasters are inevitable or vulnerability cannot be reduced further. The finance sector needs to be encouraged, even enforced to engage with disaster risk planning and incentives may be required to promote such engagement. In terms of case studies, El Salvador (14) has a federal government-initiated scheme promotes social funding to provide assistance to poor communities at risk, and case study 18 and 20: India highlight the role of micro-finance initiatives as part of the regions disaster preparedness. Caribbean case study 9: St Lucia explores the role of financial incentives within specific sectors, where structural improvements are funded through charitable finance and insurance programmes.

6. General gaps identified from a review of the literature and the case studies

- All the phases of CDM must be addressed, as opposed to a focus on e.g. emergency response after the event as occurred prior to the development of the disaster 'lifecycle' concept of prevention / mitigation, preparedness and response and recovery.
- Incentives may be required for good CDM practice.
- Risk reduction in tourism development is primarily centred on larger, individual facilities rather than across the sector. There is little engagement from small facilities such as the family-owned business often found in the tourism sector.
- There is inconsistency in promoting and enforcing building codes and standards and a generally low levels of 'willingness-to-act' in implementation, enforcement and compliance monitoring.
- There is insufficient collaboration between stakeholders both within the tourism sector and outside of it.
- There is relatively little strategic activity or monitoring of risk management developments within the sector and planning quality is variable and often ad-hoc as opposed to aiming to build on-going capacity.
- Inadequate focus is made of local and community developments such as utilizing long established local knowledge and practices in hazard assessment and management.
- Networks and partnerships for information and experience sharing are not maximised.
- The role of income/livelihood diversification needs strengthening within the context of mainstreaming disaster risk management.
- All the phases of CDM must be addressed, as opposed to a focus on e.g. emergency response after the event as occurred prior to the development of the disaster 'lifecycle' concept of prevention / mitigation, preparedness and response and recovery.
- Regional capacity is limited and should be developed possibly through centres of expertise with effective communication to guide decisions.
- Regional institutions and donor agencies need to look at their funding programmes and strategies and focus on projects which address CDM issues within any development context, and promote CDM approaches to their wider audience.
- Regional and national institutions must promote integrated CDM and support research and training.
- A paradigm shift is required including the realisation that there are no "natural disasters" – disaster occur because of combination of environmental and socio-economic circumstances.
- More economic impact studies are required identifying the total losses of disaster events - opportunities as well as social and economic dislocations.

Conclusion

Natural hazards pose a number of challenges for the Caribbean tourism sector, and the successful implementation of natural hazard risk management has major implications in the short-, medium-, and long-term for the sustainability of the industry and its stakeholders.

Several of the good practices identified in this report, relevant for the Caribbean tourism sector, appear to be being integrated by stakeholders at many levels – including at the policy, strategic, tactical and operational levels. This seems to highlight a general trend towards addressing disaster risk management and the multiple threats of natural hazards to the tourism sector; however, further action is required. The success of organizations, companies and destinations in working with disaster risk management will have implications for a range of key business parameters including insurance-related issues, consumer confidence and economic development.

The manifestations of climate change in the Caribbean region and beyond presents an increasing strain on a sector that is already feeling the pressures from a changing global economy, and rising transport costs (Simpson et al. 2008b, UNEP 2008). Despite these pressures the tourism sector, as a vital cornerstone of the economic foundation of many Caribbean countries, has multiple responsibilities when it comes to natural hazard risk management.

Tourism establishments and authorities need to ensure the safety of the guests that are visiting their premises or their destination at all times. In a natural hazard situation this might mean evacuation of foreign tourists prior to or in the aftermath of a disaster event. Tourism establishments and authorities also have a responsibility to local people in the destinations in which they are based; for example many local people work within and depend on the industry for employment and income, and in the absence of emergency shelters during a disaster event, local people may need assistance from sector businesses. In addition, the tourism sector has a responsibility to broader society to help the national economy recover; the best way to achieve this is to create resilience to natural hazards by working with risk management in a proactive way to reduce vulnerability.

Sustainable tourism “*ought to have social resilience as a critical anchor*” (Collymore 2008). Tourism is well placed to take a lead in CDM as it crosses institutional and organizational scales as well as interacting across sectors; as such it has the capacity for effective actions. It can offer leadership in initiating CDM processes that involve stakeholders, build on and learn from existing good practice, raise awareness of the challenges and of potential solutions, and develop sector-relevant disaster managements plans, systems and structures to take the region forward.

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Appendix 2: Additional Information Sources and Relevant Organizations

“Davos Declaration”. Climate Change and Tourism: Responding to Global Challenges. 2nd International Conference on Climate Change and Tourism, Davos 2007

<http://www.unwto.org/pdf/pr071046.pdf>

The Davos Declaration on Tourism and Climate Change presents the conference commitment to the mitigation of greenhouse gas emissions from tourist activities, especially those derived from transport and accommodation activities; adapt tourism businesses and destinations to changing climate conditions; apply existing and new technology to improve energy efficiency and secure financial resources to help poor regions and countries.

“Djerba Declaration” Climate Change and Tourism: Proceedings of the 1st International Conference on Climate Change and Tourism, Djerba, 2003.

<http://www.world-tourism.org/sustainable/climate/final-report.pdf>

The proceedings of the first WTO International Conference on Climate Change and Tourism, held in Djerba, Tunisia in April 2003. The report contains the main conclusions and agenda for action derived from the Conference, as well as the Djerba Declaration on Tourism and Climate Change, a WTO background paper, a list of presentations and a summary of the sessions and discussions held. Topics covered include the current scientific thinking on the subject; details of the activities of organisations acting in this field; the impact of climate change on the tourism industry; case studies from around the world detailing the impact of climate change on a variety of tourism activities and in a variety of locations; and an examination of tourism's own contribution to the causes of climate change.

Intergovernmental Panel on Climate Change

<http://www.ipcc.ch/>

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in order to assess the available scientific, technical, and socio-economic information in the field of climate change. The IPCC is organised into three main working groups: working group I concentrates on the physical science basis; working group II on impacts, adaptation and vulnerability; working group III on mitigation of climate change. The site provides information on each of the working groups, including their remit, structure and future activities; access to the four Assessment Reports; technical papers and other documents.

Tufts University Climate Initiative

<http://www.tufts.edu/tie/tci/index.htm>

The Tufts Climate Initiative (TCI) is a pioneer in the field of climate change mitigation at institutions of higher learning and in 2005, Tufts and TCI won the prestigious Environment Protection Agency (EPA) Climate Protection Award. The website includes many useful resources, including a Voluntary Carbon Offset Information Portal.

Tyndall Centre for Climate Change Research

<http://www.tyndall.ac.uk/index.shtml>

The Tyndall Centre for Climate Change Research conducts trans-disciplinary research evaluating and promoting sustainable solutions to climate change. The Centre was formed in October 2000 in collaboration between nine UK research institutions and three of the UK Research Councils - NERC, EPSRC and ESRC. The Centre's headquarters is based in the School of Environmental Sciences at the University of East Anglia. The site provides information about the Centre's activities and research themes; events; presentations, reports and publications, including online briefing notes and working papers.

United Nations Environment Programme (UNEP): Tourism

<http://www.uneptie.org/pc/tourism/>

The UNEP Tourism Programme's mission is to ensure that conservation and use of the natural, cultural and man-made environment, through sustainable management, is an integral part of all tourism development. Work in the Programme addresses three main issues: the promotion of sustainable tourism among government agencies and the industry; the development of sustainable tourism tools for protected/sensitive area management; supporting the implementation of multilateral environmental agreements related to tourism. The website provides access to guidance on best practice; UNEP publications and other relevant links.

United Nations Environment Programme (UNEP): Climate Change

<http://www.unep.org/Themes/climatechange/>

This portal site part of the UNEP main website includes publications covering scientific social economic and environmental aspects of climate change and global warming as well as the full text of scientific reports and links to other resources.

United Nations Framework Convention on Climate Change (UNFCCC)

<http://unfccc.int/2860.php>

This website provides information on the United Nations Framework Convention on Climate Change (UNFCCC). There is access to the text of the Kyoto Protocol, a listing of parties and observers, news and press releases; background to the Secretariat; news and events information and the UNFCCC library, with access to the online catalogues and official documents.

United Nations World Tourism Organization

<http://www.unwto.org/aboutwto/index.php>

The World Tourism Organization (UNWTO), a United Nations agency, is a global forum for tourism policy issues and a practical source of tourism know-how. It is the leading international organisation in the field of travel and tourism. The site provides information about the WTO and its activities; data and statistics of relevance to tourism; a news release service; events listing; online library and bookshop of WTO publications.

World Bank: Climate Change

<http://www.worldbank.org/climatechange>

Part of the World Bank's 'Environmentally and Socially Sustainable Network', aimed at delivering expertise and resources in support of the Bank's involvement in international climate change negotiations under the United Nations Framework Convention on Climate Change (UNFCCC)". The site covers key concerns about climate change and information on World Bank programmes and research projects; information on international climate change especially in relation to the developing world; online publications

Association of Caribbean States (ACS)

5-7 Sweet Briar Road

St. Clair

P.O. Box 660

Port of Spain

Trinidad and Tobago

West Indies

<http://www.acs-aec.org>

Caribbean Tourism Organization

One Financial Place

Collymore Rock

St. Michael

Barbados

<http://www.onecaribbean.org/>

Caribbean Alliance for Sustainable Tourism (CAST)

1000 Ponce de Leon Ave., San Juan, Puerto Rico

Tel: +787 725 9139

Fax: +787 9108

Email: cast@cha-cast.com

www.cha-cast.com

Caribbean Community Climate Change Centre (CCCCC)

P.O. Box 10827, Georgetown, GUYANA

Tel: +(592) 222 0001-75

Fax: + (592) 222 0171

Email: info@caricom.org

<http://www.caricom.org/jsp/community/ccccc.jsp?menu=community>

Caribbean Disaster Emergency Response Agency (CDERA)

Building 1

Manor Lodge Complex

Lodge Hill

St Michael

Barbados

<http://www.cdera.org>

Caribbean Community Secretariat (CARICOM)

P.O. Box 10827

Georgetown

Guyana

<http://www.caricom.org/>

Appendix 3: Historical Major Natural Hazard Events in the Caribbean

Table Showing Selected Historical Major Natural Hazard Events and Corresponding Values of Loss (quantified by number of persons killed, number of persons affected and damage in US\$) in CTO Member Countries (Aruba, Bonaire and Curacao not included)^{a, b}

Dates Start Date – End Date	Country	Location	Disaster Type/ Subtype/ Name ^c	Total Losses
7 May 2006	Suriname		Flood	3 killed 25,000 affected
15 January 2005	Guyana		Flood	34 killed 274,774 affected US\$465.1 million damage
21 November 2004	Guadeloupe	Basseterre, Terre-de-Bas, Saintes Isles	Earthquake	1 killed 13 injured 40 homeless 100 affected
12 September 2004	Cayman Islands	Grand Cayman	Wind Storm Hurricane Ivan	1 killed US\$3,430 million damage
8 September 2004	Grenada		Wind Storm Hurricane Ivan	39 killed 60,000 affected US\$889 million damage
14 November 2003	Dominican Republic	Duarte, Montecristi, Santiago, Valverde Provinces	Flood Coastal/ Lake Flood	9 killed 2 injured 65,000 affected US\$42.6 million
5 September 2003	Bermuda		Wind Storm	4 killed US\$300 million damage
6 May 2001	Puerto Rico	Yuaco, Guaymilla	Flood	2 killed 180 homeless 9,300 affected US\$146 million damage
30 September 2000	Belize		Wind Storm	14 killed 62,570 affected US\$277.5 million damage
15 th December 1999	Venezuela		Flood	30,000 killed 483,635 affected US\$3,160 million damage
17 November 1999 – 19 November 1999	Anguilla		Wind Storm Hurricane Lenny	150 affected US\$0.05 million damage
22 April 1997	Trinidad and Tobago	Near Trinidad	Earthquakes	2 injured 15 homeless US\$25 million damage
25 June 1997	Montserrat	Plymouth	Volcano Soufriere	32 killed 4000 affected US\$8 million damage
October 1996	St. Lucia		Slides/Landslides	175 affected
5 September 1995	Netherland Antilles	St. Marten, St. Eustasius, Saba	Wind Storm Hurricane Luis	2 killed 40,000 affected US\$15.15 million damage
5 September 1995	St. Kitts and		Wind Storm	1800 affected

	Nevis		Hurricane Luis	197,000,000 US\$ damage
15 September 1995	Virgin Island (US)		Wind Storm Hurricane Marilyn	7 killed 10,000 homeless 136,000,000 US\$ damage
24 November 1993 – 28 November 1993	Cuba	Guantanamo, Santiago de Cuba, Holguin Provinces	Flood	34 killed 32,000 homeless 500,000 affected 140,000,000 US\$ damage
April 1992	Haiti		Drought	1,000,000 affected
23 August 1992	Bahamas	Eleuthera, Bimini, Berry Islands	Wind Storm Hurricane Andrew	4 killed 1,700 homeless 250,000,000 US\$ damage
17 September 1989	Virgin Islands (UK)		Wind Storm Hurricane Hugo	8,000 homeless 2,000 affected 21,800,000 US\$ damage
September 1987	St. Vincent and the Grenadines		Flood	1000 affected 5,000,000 US\$ damage
1985	Turks and Caicos		Wind Storm Hurricane Kate	770 affected 5000 US\$ damage
November 1983	Antigua and Barbuda		Drought	75,000 affected
29 August 1979 – 6 September 1979	Dominica	Countrywide	Wind Storm Hurricane David and Frederick	40 killed 2100 injured 70,000 affected 44,650,000 US\$ damage
2 October 1970	Barbados	Entire Island	Flood	3 killed 10 injured 200 affected 500,000 US\$ damage
25 September 1963	Martinique		Wind Storm Hurricane Edith	10 killed 40,000,000 US\$ damage
14 January 1907	Jamaica	Kingston	Earthquake	1200 killed 90,000 affected 30,000,000 US\$ damage

Notes

^aNote: Prepared by Roche Mahon, CTO

^bAdapted from EM-DAT: The OFDA/CRED International Disaster Database
www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium

^cNote: In order for a disaster to be entered into the EM-DAT database at least one of the following criteria has to be fulfilled:

- 10 or more people reported killed
- 100 people reported affected
- a call for international assistance
- declaration of a state of emergency

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Appendix 4: Brief summary matrix of additional disaster risk management activities reviewed in the available literature

Overview of Other Global Good Practices Identified

Hazard Specific Good Practice	Specific Good Practice	Country	Summary of Good Practice	Benefits	Drawbacks	Appropriateness for the Caribbean
Hurricanes	Improve and enforce building codes	USA	Establish more stringent building codes to mitigate impact of winds and flood and also enforce strict testing for improvement in the quality of building material	Hurricane loss reduction	None	Appropriate (applied in some Caribbean countries such as Jamaica and Cayman Islands)
Hurricanes	Coastal Hazard Mapping	USA	Development of hazard maps for coastal development zones and using these maps to inform types of appropriate development	Reduction of tourism related impacts and zoning of coastal activities	None	Appropriate for Caribbean Countries with extensive coastal zone, appropriate for tourism development
Hurricanes	Disaster insurance / risk transfer	USA	Hazard mapping used to inform variations in coastal site vulnerability. Insurance premiums based on level of vulnerability and associated risk.	Risk mitigation construction measures for building and disincentive for occupation of vulnerable sites	Cost	Appropriate for the Caribbean but must be accompanied by rigorous hazard mapping and risk assessment.
Hurricanes	Vulnerability Assessment to inform structural and non-structural mitigation	USA	Vulnerability assessment undertaken to determine appropriate mitigation measures for coastal sites as well as provision of funding for undertaking mitigation measures by users of vulnerable sites	Mitigation measure informed by vulnerability analysis. Loss reduction through provision of funds (retrofitting etc.) for mitigation	Cost	Appropriate on small scales
Hurricanes	Improve buildings to withstand hurricane impact	USA	Retrofit and strengthen existing buildings to withstand hurricane impact.	Reduce vulnerability and impact costs. Cost reduction by deferring relocation	Not all buildings can be retrofitted to the same extent	Appropriate where retrofitting can be accommodated in the present structure.
Hurricanes	Enforce and tighten building codes	USA	Ensuring new structures have a better chance of survival against wind and floods. South Florida includes high wind provisions in codes. They have also included strict testing and approval for all building products so that materials are more likely to withstand hurricane force winds and other pressure.	More resistant buildings, reduction in hazard exposure	Older buildings are not included in this provision	Appropriate

Hazard Specific Good Practice	Specific Good Practice	Country	Summary of Good Practice	Benefits	Drawbacks	Appropriateness for the Caribbean
Hurricanes	Standardization of media information	Thailand	Establish a centralized clearing house for media information on disasters/hazards.	Reduction of public misinformation and negative responses to misinformation in the tourism industry. This promotes sustainability of tourism in vulnerable environments.	Success depends on memorandum of understanding between media houses and disaster management authorities	Appropriate and is currently being implemented and spearheaded by CDERA
Landslide-Mudslide	Eco-engineering methods to restore natural landscape	Taiwan	Eco-engineering methods to restore natural landscape especially along slopes to prevent or minimize mudslides. This ecological approach is characterized by minimal use of concrete structures and instead incorporated natural materials and traditional designs	Maintenance of natural environment, improvement in aesthetics and reduction of ecological discontinuities caused by manmade structures.	Eco-engineering sometimes requires an extended time for establishment of vegetation	Appropriate
Landslide-Mudslide	Reforestation	Taiwan	Government provides a subsidy to encourage reforestation and subsidy to owners of existing trees to discourage deforestation.	Stabilization of soils and slopes and reduction of run off	Time for establishment of vegetative barriers	Appropriate
Landslide-Mudslide	Refilling of crevices and cracks in quake stricken areas	Taiwan	Residents are encouraged to fill crevices in quake stricken areas, with earth, thus preventing rain from entering the gaps and destabilizing the soil.	Reduce the occurrence of mud and landslides and promotes community participation	May instill a false sense of security among residents as they may think this type of mitigation is better than avoidance of such locations.	Appropriate but requires monitoring
Tsunamis	Vertical Evacuation	Asia Pacific - Thailand, Indonesia, Tamil Nadu, Sri Lanka	High rise buildings are constructed to modern standards with the lower floors designed in such a way that tsunami waves flow right through. The upper floors are used as evacuation sites and whilst still maintain their intended functions	Evacuation is on site and as such reduces the time needed to relocate to another area, hotels are able to carry out their main functions - catering to its guest with little or no disruption	None	Appropriate but costly
Tsunamis	Early warning systems	Thailand	Design and implementation of a comprehensive early warning system consisting of sensors and buoys, supplemented by sea level gauge stations within larger regional tsunami observation and monitoring network. The early warning system information network is linked to the information network of ten state agencies. In the event there is a high probability of a tsunami incident occurring, a	Reduction in hazard loss, minimum exposure to the event and increased response time	Effectiveness is dependent upon links between all aspects of hazard monitoring and warning dissemination, and ensuring	Appropriate but costly

Hazard Specific Good Practice	Specific Good Practice	Country	Summary of Good Practice	Benefits	Drawbacks	Appropriateness for the Caribbean
			warning is issued to risk areas around Thailand. Data is relayed immediately via satellite. Sirens are and integral component and is supported by visual indicators such as red alert emergency wave lights and audio recordings in various international languages. To attain the widest coverage within the shortest possible time, warnings are transmitted via various other channels - ten radio stations, 21 AM radio stations, 312 FM radio stations, 169, 696 amateur radio stations and all other radio networks. Warnings are also automatically sent via SMS to some 20 million cellular users.		appropriate responses to them	
Tsunamis	Installation of tsunami warning towers	Thailand	These towers which contain loudspeakers warn tourists and residents of the possibility of tsunami, in Thai and several western languages	Reduction in hazard loss, minimum exposure to the event and increased response time	Effectiveness is dependent upon links between all aspects of hazard monitoring and warning dissemination, and ensuring appropriate responses to them	Appropriate but costly
Tsunamis	Creation of wider buffer zones/set backs	India	Requirements for set back in India and Sri Lanka were initially universal for all coastal locations but later revised to target only specific locations, in Tamil Nadu and Sri Lanka.	Reduced exposure to tsunami waves	Costly	Appropriate but costly
Tsunamis	Establishment of coastal bio-belt/ bio-wall using casuarina	India, Indonesia, Thailand	Establish bio-belts managed through forestry department (maintenance is critical.) Using casuarina, coconuts or pandanus as bio-belt or bio-wall - equivalent of seawall but using vegetation instead.	Mimicking of the natural environment by this measure reduces environmental discontinuities associated with manmade structures	Need to ensure non-invasion of alien species, extended generation and maturity time for vegetation	Appropriate
Tsunamis	Seawalls	Japan, India	Japan, one of the countries most at risk to tsunamis have began to build massive coastal defences to hold back waves or at least reduce their impact. Sea walls up to 5 or 6 meters high currently protect many towns around the coast, whilst the biggest breakwater in the world is being built in north-eastern Japan. It will be 2 km long and 63 meters deep.	Reduce impact zone and reduction in hazard loss	Costly	Appropriate
Earthquakes	Revised building codes	Mexico	Building codes were revised to incorporate more stringent mitigation measures	Newly constructed buildings are built to	Retrofitting of existing	Appropriate but costly

Hazard Specific Good Practice	Specific Good Practice	Country	Summary of Good Practice	Benefits	Drawbacks	Appropriateness for the Caribbean
				withstand earthquakes up to a magnitude of 5 on the Richter scale	infrastructure can be costly	
Earthquakes	Construction of buildings with shocks absorbers	Mexico	Newly constructed hotels and other high-rise buildings are constructed with special foundations mounted on hydraulic shock absorbers that allows the buildings to contort with shock waves but not crumble or break	Reduction in impact on infrastructure and livelihood	Costly	Appropriate but costly
Earthquakes	Standardization of media information	Japan, Taiwan	Establishing a centralized clearing house for media information on disasters/hazards.	Reduce public misinformation and negative responses to misinformation in the tourism industry. This promotes sustainability of tourism in vulnerable environments.	Success depends on understanding between media organizations and disaster management authorities	Appropriate and is currently being implemented and spearheaded by CDERA
Earthquakes	Reconstruction of public facilities	Taiwan	The tourism bureau in Taiwan assisted in the reconstruction of public facilities under a program of relief loans for tourist industries in stricken areas. The program permitted large and small tourism operators to apply for low interest loans from small and medium business banks.	Timely return of public services and essential services. Additionally operators within the industry benefited from low interest loans	Requires an effective system of needs evaluation, loan disbursement and monitoring	Appropriate
Earthquakes	Financial incentives through discounted airfares	Taiwan	To attract tourists to Taiwan after the earthquake significant discounts were given on ticket fares for routes from Japan and Hong Kong since tourists from these areas dominated the inbound market in Taiwan. In addition promotional materials were mailed by international tourists hotels to every previous guest in an attempt to rescue the tourism industry	Motivation of tourists to return shortly after impact, minimization of long term dislocations in tourism sector	This measure is costly	Appropriate but costly
Volcanic eruptions	Creation of channels	Philippines	Wider stream channels were constructed to accommodate large lava flows	Passage of lava is controlled and doesn't spill over	Requires regular maintenance	Appropriate
Volcanic eruptions	Creation of dams	Philippines	Large dams are created to accommodate lava flow from channels as well as redirect the flow from certain areas	Flow is streamlined and controlled	Requires regular maintenance	Appropriate
Volcanic eruptions	Creation of hazard maps	Philippines	Hazard maps are constructed and used to identify vulnerable communities and infrastructure	Zoning allows channelling of lava flows and minimizes exposure to the hazard	Requires scenario building and testing and regular updating	Appropriate
Volcanic eruptions	Early warning system for lava flows	Philippines	Early warning e.g. rain gauges provide data on rainfall in lava source regions and provision of manned watch points	Increased response time, reduction in hazard loss	Requires constant monitoring	Appropriate

Overview of Other Caribbean Good Practices Identified

Tourism Development Good Practices	Specific Good Practice	Country	Summary of Good Practice	Benefits	Drawbacks
Hurricanes	Development of a national hurricane committee	Cayman Islands	Utilization of existing small networks and volunteers in the Cayman Islands by the government helped to establish a national hurricane committee.	Participation of committed volunteers, small group sizes, collaboration across government departments and willingness to consider range of approaches	The need for multi-tasking reduces normal occupational input
Hurricanes	Incorporation of lessons learnt externally into policy development	Cayman Islands	The Cayman Islands uses lessons learnt from hurricane impact in other regions/locations to inform policy change for hurricane loss reduction as well as promotion of awareness through persuasion.	Expanded capacity to predict and prepare for hazard impact based on lessons learnt from external sources	Sometimes result in the development of policies that ignore internal advice and planning guidelines
Hurricanes	Enhanced building code	Cayman Islands	Construction standards were increased to ensure new buildings are designed to withstand hurricanes and associated winds	More resistant buildings, reduction in hazard exposure	Older buildings are not included in this provision
Hurricanes	Changes in Development and Planning Regulations	Cayman Islands	Coastal set back for waterfront properties was changed from low water mark to the high water mark island-wide In the Hotel/Tourism zone setback was increased from 100 feet to 130 feet	Reduction in storm surge vulnerability Reduced impact cost Reduced property loss	Costly to relocate existing property Legal implications for existing properties
Hurricanes	Visioning for Hurricane Impacts	Cayman Islands	Vision 2008 was established to: Support the existing laws, policies and planning documents Promote protection of life and property in the tourism industry by supporting comprehensive contingency planning for natural and man-made disasters Ensure preservation of human life, protection of property and economic recovery of the country.	Contextualization of hurricane loss reduction within existing laws and policies Property loss reduction within tourism industry Human and economic loss reduction	None
Hurricanes	Identifying target timescales to achieve goals	Grenada	Establishment of a 30 day short term tactical recovery plan for the Cruise Ship industry. This includes service product enhancement and standardization of tourism media information.	Target specific recovery Reduction of recovery timeframe Improved quality of service Improvement in information dissemination	Cost

Hurricanes	Outcome focused vision for emergency management	Guyana	Formulation of emergency management outcomes and related plans through the establishing detailed contingency plans for each sub sector of the industry	Clarification of stakeholder responsibility, reduced response time, comprehensive and sequential emergency response	Requires an efficient mechanism for integration of stakeholder in emergency management and therefore would have cost implications
Hurricanes	Establishment of partnership among industry stakeholders	Guyana	Development of initiative to ensure participation in decision making by all stakeholders	Ownership of decision making process by <i>all</i> stakeholders, multidirectional communication among stakeholders and this facilitates bottom up decision making	Potential drawback where there are significant variations in the outcome objectives of stakeholders
Hurricanes	Integration of Disaster Recovery Agencies in disaster management planning	Guyana	Ensuring representation of disaster recovery agencies into the disaster management planning as a means of streamlining task force responsibilities	Reduction in ad-hoc time, clarity of emergency responsibilities, improved awareness of response procedures and sequence	Requirements for scenario building and simulation
Hurricanes	Establishment of a National recovery Plan	Guyana	A national recovery plan was established which incorporated strategies addressing the need for sustainable tourism in the short and long term, addressing visitor safety and security, and tourist and operator expectations whilst mitigating negative publicity and doing so in budget	Allows streamlining of recovery activities, prioritization of the areas for recovery	Conflict between personal and national rehabilitation, delays in budget process and emotional consideration