



R3I Outcome Evaluation and Vulnerability Benchmarking (B-tool) Exercise



*Regional Risk Reduction Initiative (R3I):
A project aimed at improving disaster
management systems and reducing the
exposure of countries to the devastating
impacts of natural hazards*



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Submitted by

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ACRONYMS

ARU	Aruba
AXA	Anguilla
BCM	Business Continuity Models
CAP	Common Alerting Protocols
CDM	Comprehensive Disaster Management
CDEMA	Caribbean Disaster Emergency Management Agency
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute of Meteorology and Hydrology
DfID	Department for International development (now referred to as UKAID)
DRM	Disaster Risk Management
EC	European Commission
ECDMG	Eastern Caribbean Donor Group for Disaster Management
EOC	Emergency Operation Centre
EU	European Union
EWS	Early Warning Systems
GIS	Geographical Information System
HFA	Hyogo Framework for Action
ITU	International Telecommunication Union
MNI	Montserrat
NASA	National Aeronautics and Space Administration
OCTS	Overseas Countries and Territories
PAHO	Pan American Health Organisation
PAIG	Pan American Institute of Geography and History
PME Handbook	UNDP handbook on Planning, Monitoring and Evaluating for Development Results
POE	Public Outreach and Education
R3I	Regional Risk Reduction Initiative
REMPEITC	Regional Marine Pollution Emergency Information and Training Centre.
RMI _{DP}	Risk management Index for Disaster Preparedness
RMI _{RI}	Risk Management Index for Risk Identification
RDS	Radio Data System
SAR	Search and Rescue
SRU	Seismic Research Unit (of the Caribbean)
SXM	Sint Maarten
TDRMI	Total Disaster Risk Management Index
TMT	Technical Management Team
UCAR JOSS	The Joint Office for Science Support (JOSS) of the University Corporation for Atmospheric Research (UCAR)
UKAID	United Kingdom Agency for International Development
UN	United Nations
UNDP	United Nations Development Programme
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNESCO IHE	UNESCO Institute for Water Education
UNESCO-IOC	The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization
UWI	University of the West Indies
WMO	World Maritime Organisation

EXECUTIVE SUMMARY

1. The Project

The Regional Risk Reduction Initiative (R3i) for the Overseas Countries and Territories (OCTs) was designed to strengthen the capacity to predict and prepare for natural and human-induced hazards. The Project's geographical scope included: Anguilla, Aruba, Bonaire, Cayman Islands, Curaçao, Montserrat, Saba, Sint Eustatius, Sint Maarten, Turks and Caicos Islands, and Virgin Islands.

The European Commission provided €4.932m for R3i for an initial period of 3 years (2009-2011); the project was subsequently extended for an additional period, up to December 31st 2012.

The specific strategies to be employed included:

- establishing harmonised systems for risk identification, assessment, monitoring and early warning
- Institutionalising disaster risk reduction, knowledge management, and education
- Reducing underlying factors that contribute to risk exposure
- Establishing functional inter-sectoral response and recovery systems and mechanisms
- Developing and using risk indicators for the prevention and mitigation of natural disasters and assessment of their socioeconomic and environmental effects.

Specific outcomes of the project were to be:

- Support the disaster management departments and GIS units in the OCTs in their modelling, simulation and planning capacities
- Build upon the experience and knowledge in Cayman Islands to develop surge run-up and wave action models
- Integrate results of modelling into quantitative multi-hazard vulnerability maps for dissemination to a broad base of stakeholders throughout the OCTs
- Complete and/or initiate building vulnerability studies and improve quantitative risk assessment of critical infrastructure in OCTs and dissemination of the results to support the investment in hazard mitigation strategies.
- Conduct a feasibility study and pilot for the development of a real-time regional alert, warning and notification system throughout the OCTs, based on the experience of the Adapt Anguilla National Warning System.
- Define an overarching response and recovery capacity network and define resource sharing and mutual aid agreements.
- Take into consideration the outputs and outcomes of recent and existing initiatives and extend them to the OCTs.

- Disseminate best practices by organising practitioner seminars/workshops and online documentation and training
- Strengthen linkages among OCTs and other Caribbean countries so that they may network among themselves to continue to exchange information and best practices in a sustainable matter.
- Ensure country priorities are always understood and there is national ownership of the initiatives
- Share lessons learned and best practices in a diverse regional context.

2. Rationale for the Evaluation

At the end of the project, the UNDP contracted for an independent evaluation to assess the level of change in measured variables and level of success of the outputs and outcomes achieved. The objective of the Evaluation is to “demonstrate the level of change in the measured variables and level of success of the outputs and outcomes achieved” through the Project.

3. The Evaluation Methodology

The evaluation was conducted between November 19 and December 21, 2012. The scope of the review included field visits to: Anguilla, Aruba Bonaire (including Saba and St. Eustacius), Cayman Islands, Curacao, Montserrat, Sint Maarten, and the Virgin Islands. Remote interviews were conducted with personnel in Turks and Caicos Islands. Additionally, the team leader held inception meetings in Barbados with the Project Coordinator and officials in the EU Delegation in Barbados and UKAID. Two team members also met with the project Focal Points in Jamaica.

The review focused on 5 outputs in the project:

- i. Hazard Mapping and Vulnerability Assessment
- ii. Early Warning Systems
- iii. Response, rescue and recovery
- iv. Technical assistance
- v. Project coordination

The process followed in the review consisted of:

- A review of project documentation.
- An evaluation of Project Performance Indicators used to measure progress made by individual countries.
- Based on the documentation and performance indicator reviews, a draft questionnaire was developed, field tested in the Virgin Islands and then revised. The questionnaire was adapted for use in interviewing consultants and other experts used by the UNDP.
- Stakeholder interviews and focus group discussions were conducted in all the territories, except the Turks and Caicos Islands. Interviews were also conducted with 14 consultants and technical specialists who were involved with the major contract engagements for this project.

- Evaluators attended the end of project wrap-up review held in Jamaica, and reviewed materials distributed at that conference.
- Evaluators worked with field staff to update their Vulnerability Benchmarking Tool (B-Tool).
- On site observations were carried out on 8 islands.

4. Findings

The project is set in following context:

- The OCTs are small islands, highly vulnerable to a range of natural hazards including earthquakes, hurricanes, floods, landslides, tsunamis and volcanic eruptions. Other hazards that impact the region include water contamination, oil spills, infectious disease, and progressive environmental damage.
- The islands have limited natural resource bases, and there is high competition between stakeholders for land use.
- The OCTs are relatively inaccessible compared to continental land masses and this can result in delays and reduced quality of information in a crisis.
- Most of the islands have exposed interiors and narrow coastal zones.
- Their small populations and increasing population concentrations on coastal zones lead to higher risks of serious damage and high per capita costs for infrastructure and services.
- Their small economies with high dependence on tourism and related tourism development make them vulnerable to socio-economic pressures that are often at odds with sound disaster mitigation and climate adaptation strategies. Consequently, there is inadequate enforcement of existing laws with regard to planning approvals
- Slow rate in the changing culture from disaster response management to risk reduction
- Inadequate levels of human, technical and financial resources
- Inadequate political commitment
- Most islands had limited hazard forecasting ability and less capacity to respond to serious disasters before this project
- Due to affiliated vulnerabilities, the development of hazard assessment, warning and remediation systems on one island can yield lessons for all coastal zones and be applied to others.

This was an ambitious and complex project. It introduced new paradigms in disaster management and concepts of cross country cooperation not often encountered between the OCTs in the Caribbean. It was therefore expected that issues would be encountered in the development of the project and its execution.

- This project was generally regarded as well managed and coordinated
- About 80% of the countries rated UNDP's method of delivery to be very good and they appreciated the consultative approach and the attempts that were made by UNDP to ensure that the beneficiaries were involved in decision making.

- All countries, with the exception of one, agreed that UNDP was the best choice for project implementing agency.
- The project was very relevant to the needs and priorities of each of the participating countries although they were at different levels of disaster management and different levels of capacities
- The Project Outputs and activities were consistent with the recommendations from the 2010 B-Tool Assessment
- The project provided a very important forum for the OCTs to share experiences, to learn from each other, and to share knowledge in general and there were many examples given of transfers of information between colleagues participating in the project from different islands.
- There was also substantial exposure to new approaches in various aspects of disaster management.

The specific accomplishments are identified in the table below.

Expectations	Achievements
<ul style="list-style-type: none"> Increased capacity in hazard mapping and associated vulnerability assessments, to further be incorporated into spatial information systems to inform planning and development processes A regional early warning systems (EWS) pilot for the OCTs, based on the ITU automated alert protocol for warnings 	<ul style="list-style-type: none"> All countries increased their capacities to create and manage hazard maps and vulnerability assessments, through 5 regional trainings, numerous national trainings and the provision of Geographical Information System (GIS) equipment and software. Trainees included people from planning, public works and environment departments. The project provided hazard and vulnerability geographical data-bases – applying EU INSPIRE standards - to countries which did not possess one. Most advanced countries took further steps with topographic and bathymetric data collection allowing coastal hazard modelling and mapping. Sint Maarten and the Virgin Island now have storm surge and tsunami maps based on advanced scientific modelling at a resolution allowing adequate decision making for development processes. Particular excitement appeared around field data collection on the vulnerability of countries critical buildings using modern portable technology (GPS / GIS devices). This simple methodology allows a continued data collection. Interesting work on vulnerability curves (Cayman), Geodetic and LiDAR surveys (Anguilla), landslides cut slope risk assessments (Virgin island, Sint Maarten and Anguilla) and seismic hazard (Aruba) has also been delivered. 4 countries (Anguilla, Sint Maarten, Montserrat and Aruba) are now dotted with an operational Alerting system, based on Anguilla's example and applying the Common Alerting Protocol standard. Their system forms a regional network, each country being capable of backstopping the other ones. Each country possesses email notification and automatic radio broadcast interruption systems. In addition: <ul style="list-style-type: none"> Montserrat sirens are mended and automatised, Montserrat alert system via Radio Data system (RDS – text messages sent to receivers boxes) is now complete and automatised

- Anguilla's existing system is enhanced and completed with a Marine radio alert system and 194 radio receivers delivered.
 - First responders in Aruba are provided with 75 Smartphones with customized application ("App") working on Android and Apple and operated from a Cloud based platform.
- Policies and protocol are enhanced with templates including a CAP alerts message templates in 5 languages and a sound analysis of each country's specificities.
- A multi-lingual (English, Dutch, French, Spanish and Papamiento) public awareness campaign "STAY SAFE" was developed and rolled out in 2 countries, with numerous materials including public websites linked directly to email subscription to receive alerts.
- Non-pilot countries received plans and templates for their EWS development based on sound analysis of their EWS capacities.
- Capacity built in response, rescue and recovery, in order to shorten recovery periods.
- Aruba, Curacao, Turks and Caicos and Cayman islands now each have in place a light search and rescue team of 20 rescuers, equipped and trained according to INSARAG guidelines. During the project implementation period, 2 persons were successfully rescued by team Aruba and team TCI, proficiently using technics and equipment acquired with the project.
- 5 countries (Aruba, Anguilla, Sint Maarten, TCI and Saba) are trained in oil spill management and have consequently updated their oil spill contingency plans.
- Montserrat emergency telecommunication infrastructure (VHF radios) is significantly upgraded to allow interconnectivity between the country's agencies.
- Emergency telecommunication systems are also upgraded in Anguilla, Curacao and Aruba
- Trainers from the Virgin Island government provided Shelter management trainings to 6 countries (Aruba, Curacao, Bonaire, Sint Maarten, Montserrat and Sint-Eustatius)
- Across 10 countries, 38 participants (on a total of 54) completed an Intensive Business Continuity Management (BCM) online course. 31 of them earned the professional designation of "Certified Continuity Manager".
- Strengthened local disaster management structures and capacities in terms of tools and best practices to support
- Each country assessed their comprehensive disaster management capacity in 2010, using a common evaluation tool (the Benchmarking tool "B-tool"). This

comprehensive disaster risk management

assessment was updated during the project's final evaluation in December 2012.

- OCTs Stakeholders shared experiences and best practices through numerous platforms including:
 - The Comprehensive Disaster Management Conferences in 2010, 2011 and 2012
 - Conferences on sustainable construction (ISE), disaster risk reduction (ACS and EIRD), tsunamis (UNESCO IOC), early warning system (WMO) and Geographical information systems (URISA)
- Internationally recognized experts in various field, worked alongside countries stakeholders, providing impetus and quality control to activities. Experts provided timely and targeted recommendations, and their involvement ensured that the project was on good track.
- Greater cooperation and coordination between the OCTs, with documentation and dissemination of best practices
- In many tangible and un-tangible ways OCTs have developed links, common practices and a sense of professional community.
- Best practices were captured and disseminated through the publication of 6 different booklets, a video documentary, and a digital compendium of all project's outputs.

Despite the achievements, the evaluators found:

- The project got off to a slow start and was not fully staffed and organized until 2010
- The needs and priority assessments developed at the inception of the project from the field were often “vague” or unrealistic
- There were delays in approving a one year extension of the project despite the fact that it became obvious that deadlines were not going to be met.. this results in anxiety among the stakeholders.
- The Project’s efficiency was affected by its size, complexity and short time frame
- Although they had technical expertise, contractors often had weaker project management skills and some had limited experience in the Caribbean. Some persons interviewed felt that the capacity of companies to handle technical assignments should have been more thoroughly investigated by staff who were familiar with the technical requirements of the project.
- Output budgets were changed during the life of the project to accommodate higher than anticipated costs. There were some frustrations expressed about the time required to make those changes.
- Many persons felt that they did not understand the procurement procedures and that these procedures caused significant delays.
- A number of instances were reported where working relations between government agencies and between the OCTs themselves were strained due to the pressure of completing assignments on time
- There were documented instances where some agencies were reluctant to provide information to their counterparts
- There are still some projects that are incomplete because of the early planning and start up problems
- Country expectations exceeded what the project could deliver on time and within cost
- Although the capacities of agencies had been greatly increased through the training and new equipment received through the project, these agencies needed more staff to be better able to manage the on-going work that has resulted from the project
- There continue to be concerns about the sustainability of the work done because stakeholders immediately outside of the project e.g. legislators, policy staff and politicians have not been fully apprised of their roles to ensure a continuing disaster management program.
- The project has apparently not “sold’ the benefits of a comprehensive disaster management program to private groups such as developers and the tourist industry, a feature that would ensure long term support for these initiatives.

5. Project Rating

Efficiency and effectiveness of use of EU funds “A” RATING

The Project Coordinator has confirmed that close to 99% of the funds have been used.

Progress towards outputs “A-” RATING

The project has delivered more than 95% the outputs as identified in the 2012 revised results and results framework and as identified in the R3I Project Document. This rating is based on the evaluation of outputs as of December 2012.

Progress towards outcomes “B+” rating

It is too early to evaluate on progress towards outcomes. Not all outputs had been delivered at the time of the evaluation and in some instances while the outputs had been delivered the countries had not as yet reviewed and commented on the deliverables.

Relevance of outcomes “Neutral” RATING

The relevance of outcomes cannot be determined by this evaluation. As such this outcome will be rated as, “Neutral”.

6. Lessons Learned

Despite some of the downsides to the project the R3I has shown that a project can be centrally coordinated and managed while benefits redound at the national level. There are a number of lessons to be learned:

- i. The project’s governance structure ensured that countries participated in the decision making – on the project’s board and on the technical management teams
- ii. UNDP ensured country concerns were usually resolved in a timely manner when possible, especially when it came to some vendors.
- iii. Project meetings were organized to ensure that country focal points were always kept informed about the project.
- iv. Appropriate technical expertise was retained to provide guidance and quality assurance and to ensure a source of continued technical support
- v. Complex and overly ambitious projects need sufficient time for implementation. This project was initially not provided sufficient time to be fully implemented.

7. Recommendations

- i. The project has developed the potential to track and report on information that could form an important part of the dialogue on climate change at a world level, not just for the Caribbean but for all small island communities.
- ii. The project set up a structure and number of forums where international experts and national and regional stakeholders could meet discuss these issues. There could be tangible long term advantages to pursuing this activity and keeping these issues in the public eye.
- iii. There are many lessons to learn from R3I and these lessons should be incorporated into any regional project on disaster management in the Caribbean. The Disaster Risk Reduction Project that is presently being designed by the CDB and CDEMA will be well placed to review the experiences of R3I.

- iv. It is important to filter the “wish lists” of countries participating in projects like R3I very carefully to ensure that interventions are consistent with capacities, priorities and national needs.
- v. It is important for regional projects to ensure that national expectations are consistent with only what the project can deliver within the stated time and budget allocation. Dissatisfaction usually results when expectations far exceed what the project can deliver and will also impact on the sustainability of the project outputs at the national level.
- vi. Regional projects must be designed to allow for exchanges of experiences, lessons learned and to source and provide technical assistance to other countries and regional projects. In addition, all attempts should be made to ensure that there are synergies between national and regional projects and conflicting overlaps are minimised.
- vii. Regional projects need to ensure that expertise in the management and coordination of complex projects can be retained in the region by ensuring that an external project coordinator is understudied by a regional person.

7.1 Action oriented recommendations

- i. It is recommended that the UNDP discuss with the CARICOM Secretariat, the Caribbean Community Climate Change Centre or another appropriate agency the possibility of storing the valuable technical information , including specifications for equipment, terms of references for contractors, etc. produced during this project so that it can be easily accessed in the Caribbean.
- ii. The UNDP should develop a database of expertise that has been developed in hazard mapping, hazard analysis, early warning systems and search and rescue for use by other countries in the Caribbean and to small island States in general.
- iii. Although the project activities terminate on December 31st 2012, the UNDP Office for Barbados and the OECS must ensure that they carry out their commitment by developing a mechanism that will allow countries to bring forward issues and concerns for resolution on project deliverables that have been received in or after December 2012.
- iv. The UNDP should undertake an outcome evaluation in about another 12 to 18 months to evaluate the impact of the project. Although this evaluation has provided a good rating for the project, concerns still prevail over how countries will continue to finance and maintain the deliverables that have been provided to them.

CHAPTER 1

1.0 INTRODUCTION

Like most of the independent states in the Caribbean the Caribbean dependent territories of the United Kingdom and the Kingdom of the Netherlands are also small islands, highly vulnerable to a range of natural hazards including earthquakes, hurricanes, floods, landslides, tsunamis and volcanic eruptions. Other hazards that impact the region include water contamination, oil spills, infectious disease, and progressive environmental damage. Increasing incidence of such disasters coupled with the small size of these islands compound their intrinsic and acquired vulnerabilities. Further, the concentration of settlements and critical national functions in coastal zones; fragile ecosystems; and the sensitivity of the two major economic sectors, tourism and agriculture, exacerbate these vulnerabilities.

Global climate change poses its own particular problems. Climate-related disasters are increasing in frequency and numbers of people affected, with the vast majority occurring in developing countries. Significant strides need to be made to prepare for the impacts of sea level and temperature change and to reduce the associated risks. Furthermore, there is a real need for support in building capacity for information systems (e.g. damage and loss assessments, hazard and vulnerability mapping, etc.) and response mechanisms to facilitate decision making for mitigation and early recovery; and reinforcing a culture of proactive planning and response in disaster mitigation and risk reduction.

The Overseas Countries and territories (OCTs) in the Caribbean are further restricted in terms of their ability to access funding and resources to reduce the risk from hazard events. Protection measures such as hurricane-resistant materials and constructions are not fully deployed due to diseconomies of scale. Thus, the OCTs in general are less able to readily recover from a disaster due to limitations in terms of resilience and redundancy in critical infrastructure, comprehensive disaster education, and critical resources; and the capability to measure the cost recovery implications of a large disaster event.

The OCTs Regional Risk Reduction Initiative (R3I) was therefore a response to address the risk and exposure of these small islands by strengthening their capacity to predict and prepare for natural and human-induced hazards, and thus improve resilience and reduce risk and subsequent loss.

The Project's geographical scope extends the English and Dutch overseas countries and territories in the region, with the exception of Bermuda. Specifically, it targeted Anguilla, Aruba, Bonaire, Cayman Islands, Curaçao, Montserrat, Saba, Sint Eustatius, Sint Maarten, Turks and Caicos Islands, and Virgin Islands.



FIGURE 1: Location of the project countries and territories

Source: http://www.iho-machc.org/maps_photos/maps.html

The European Commission provided €4.932m for an initial period of 3 years (2009-2011); the project was subsequently extended for an additional period, up to December 31st 2012.

The overall goal of the R3I project was to support efforts to enhance regional and national capacities for disaster risk reduction and effective recovery, particularly within the context of climate change.

The specific strategies to be employed included:

- establishing harmonised systems for risk identification, assessment, monitoring and early warning
- Institutionalising disaster risk reduction, knowledge management, and education
- Reducing underlying factors that contribute to risk exposure
- Establishing functional inter-sectoral response and recovery systems and mechanisms
- Developing and using risk indicators for the prevention and mitigation of natural disasters and assessment of their socioeconomic and environmental effects.

Specific outcomes of the project were to be:

- i. Support the disaster management departments and GIS units in the OCTs in their
- ii. modelling, simulation and planning capacities
- iii. Build upon the experience and knowledge in Cayman Islands to develop surge run-up and wave action models

R3I: A regional project with a national response.

Box 1

National buy-in and participatory governance

Several months were spent in extensive stakeholder consultations with the disaster managers and territorial authorising officers (TAOs) of the participating territories, alongside the EC, to consolidate the components of the project, indicative activities and project management structures. This was an important opportunity for ensuring ownership of the project by the OCTs as they were intimately involved in crafting its structure so that it would address their specific needs. Disaster managers were also able to identify the priorities for their territory in relation to the planned activities. This process was also critical for managing the expectations of various groups as to the scope and expected results of the project.

An innovative governance mechanism, Technical Management Teams (TMTs), was also proposed by the OCTs through which they would also have greater involvement in shaping implementation and in the governance process. These TMTs are devised by project output, and the OCTs noted which ones they preferred to participate in as relating to country needs or expertise.

- iv. Integrate results of modelling into quantitative multi-hazard vulnerability maps for dissemination to a broad base of stakeholders throughout the OCTs to support the investment in hazard mitigation strategies
- v. Complete and/or initiate building vulnerability studies and improve quantitative risk assessment of critical infrastructure in OCTs and dissemination of the results to support the investment in hazard mitigation strategies.
- vi. Conduct a feasibility study and pilot for the development of a real-time regional alert, warning and notification system throughout the OCTs, based on the experience of the
- vii. Adapt Anguilla National Warning System, to the diverse local conditions.
- viii. Define an overarching response and recovery capacity network addressing such issues as training and exchanging of best practices in search and rescue operations, shelters, and improving of Emergency Operation Centre (EOC) management, as well as defining resource sharing and mutual aid agreements.
- ix. Take into consideration the outputs and outcomes of recent and existing initiatives including UNDP Early Recovery Capacity Building initiatives and the CDEMA Caribbean Search and Rescue Programme and extend them to the OCTs.
- x. Disseminate best practices by organising practitioner seminars/workshops and online documentation and training through various partners in the region.
- xi. Strengthen linkages among OCTs and other Caribbean countries so that they may network among themselves to continue to exchange information and best practices in a sustainable matter.
- xii. Reinforce the relationships between the OCTs, regional disaster management institutions, and the wider UN system from which the OCTs can access tools, best practices and expertise.
- xiii. Secure continued national ownership, and ensure country priorities are always understood and are the targeted focus for activities. To this end the OCTs have collaborated to formulate an innovative

addition to the project governance role. Technical Management Teams (TMTs) the

territories themselves were to have advisory roles in the implementation of activities according to their specific needs. A TMT was to be formed for each project output (one for both outputs 4 and 5), and will give guidance in the structuring and implementation of the activities under these outputs, with country-specific Input in relation to needs, priorities and expertise.

- xiv. The lessons learned and increased cooperation and national ownership resulting from the use of this process would be shared as a best practice for project management in a diverse regional context.

Figure 2: Participants at the launch of the project in Aruba, 2011



Credit R3I Project

1.1 Rationale for the Evaluation

At the end of the project, the UNDP contracted for an independent evaluation of the project's "successes". The objective of the Evaluation is to "demonstrate the level of change in the measured variables and level of success of the outputs and outcomes achieved" through the Project. The Evaluation will result in the analysis of:

- i. The relevance of the project to the participating Territories;
- ii. The regional dimension of the Project;
- iii. The extent to which a regional project can respond to specific national needs;
- iv. The effectiveness and efficiency with which EU resources were used in the implementation of the Project;
- v. The extent to which the outputs of the Project are useful to the beneficiaries;
- vi. The extent to which the outputs of the Project are contributing or will contribute to the stated outcomes of the project;
- vii. The extent to which the results of the Project will be sustained;
- viii. UNDP's performance in implementing the project and as the development partner;
- ix. UNDP's relationship with the other partners who were involved in the Project and the extent to which these relationships increased the efficiency, effectiveness, and cost sharing of resources;
- x. UNDP's contribution to enhanced regional and national capacities for disaster risk reduction and for effective recovery; and
- xi. How this project contributes to UNDP's mandate in enhancing conflict prevention and disaster risk management capabilities.

As identified in the TORs, the indicators found in the Project Document at output level were specified as follows:

Output 1:

- Number of national GIS databases updated with geospatial datasets and vulnerability information
- Number of national personnel trained to collect and manage geospatial data

Output 2:

- Number of countries with operational EWS pilots

Output 3:

- Number of training activities completed to improve local capacities
- Number of national policies formulated or revised

Output 5:

- Number of new joint activities executed based on common priorities

The outcome level indicators provided in the TORs are as follows:

- % increase in risk management index for risk identification (RMI_{RI})
- % increase in risk management index for disaster preparedness (RMI_{DP})
- % increase in total disaster risk management index (TDRMI)

The baseline will be the results of the Vulnerability Benchmarking tool (B-tool) 2010 in OCTs.

The targets to be reviewed during the evaluation are:

- 15% average increase in RMI_{RI} across all OCTs (i.e. 50% to 65%)
- 15% average increase in RMI_{DP} across all OCTs (i.e. 61% to 76%)
- 10% average increase in TDRMI across all OCTs (i.e. 51% to 61%)

1.2 The Evaluation Methodology

The review was conducted between November 19 and December 21, 2012. The scope of the review included field visits to: Anguilla, Aruba Bonaire (including Saba and St. Eustacius), Cayman Islands, Curacao, Montserrat, Sint Maarten, and the Virgin Islands. Remote interviews were conducted with personnel in Turks and Caicos Islands. Additionally, the team leader held inception meetings in Barbados with the Project Coordinator and officials in the EU Delegation in Barbados and UKAID.

The review focused on 5 outputs in the project:

- vi. Hazard Mapping and Vulnerability Assessment
- vii. Early Warning Systems
- viii. Response, rescue and recovery
- ix. Technical assistance
- x. Project coordination

The process followed in the review consisted of:

- A review of project documentation. The evaluators reviewed the entire suite of project documents including background information, project design documents, field reports and technical data. See Appendix 1 for a complete list.
- An evaluation of Project Performance Indicators used to measure progress made by individual countries particularly actual results against expected results. The evaluators reviewed the original indicators developed for the project and compared them with current progress information.
- Based on the documentation and performance indicator reviews, a draft questionnaire was developed for use on field visits. These questions were field tested in the Virgin Islands and then revised. The questionnaire was adapted for use in interviewing consultants and other experts used by the UNDP. The questions are presented in Appendix 2. The Evaluation Matrix is presented in Appendix 3
- 1 evaluator attended the end of project wrap-up review held in Jamaica and reviewed materials distributed at that conference. Another evaluator attended other sessions held at the conference which was sponsored by CDEMA and included background information on disaster prevention and management pertinent to this project.
- Stakeholder interviews and focus group discussions were conducted in all the territories, except the Turks and Caicos Islands, to obtain information on the level of satisfaction concerning operations, level of inputs and outputs, and other contextual factors. Interviews were also conducted with 14 consultants and technical specialists who were involved with the major contract engagements for this project. See Appendix 4 for list of stakeholders interviewed.
- Evaluators worked with field staff to update their Vulnerability Benchmarking Tool (B-Tool). The B-Tool was first completed in May, 2011 and estimated the percentage of work completed for each initiative undertaken to that point in the project. The B-Tool; was updated to reflect the current status of work accomplished for outputs one to three of the project.
- On site observation were carried out on 8 of islands. Remote interviews were held with St. Eustacius and Saba from Bonaire. Electronic exchanges took place with officials in Turks and Caicos.
- Discussions were held between the team leader and the Project Coordinator right through the evaluation.
- Data collected from primary and secondary sources were triangulated in order to ensure consistency in the data presented in this Report.

CHAPTER 2

2.0 THE DEVELOPMENT CHALLENGE

2.1 Historical Trends and Development Challenges

The English and Dutch Overseas Countries and Territories in the region are a total of 7 territories (Anguilla, Aruba, Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos, and the Netherlands Antilles (Bonaire, Curacao, St Maarten, Saba, and St. Eustatius)).

In 2009/2010, Bonaire, St. Eustatius, and Saba became municipalities of the Kingdom of the Netherlands with adjustments for their small size, their distance from the Netherlands and their geographic situation in the Caribbean region. Sint Maarten and Curacao, on the other hand, have joined their sister island of Aruba to acquire the status of countries within the Kingdom of the Netherlands. These 3 islands are full autonomous partners within the Kingdom, alongside the Netherlands, and each enjoys a high degree of internal autonomy. The constitutional change for the Dutch Antilles came on 10 October 2010 (and was known as 10/10/10).

The Caribbean countries and territories are located from Suriname, just 2° above the equator, to the Bahamas, whose northward extension is roughly 5° north of the Tropic of Cancer, the same latitudinal extent that provides the conditions of warm, moist air and clockwise Coriolis Force required for the formation of tropical depressions, storms and hurricanes; and from Belize to the west at 89° longitude to Barbados in the Eastern Caribbean located at 59° W longitude. The islands in the Eastern Caribbean, arranged in a distinct arc, mark the leading edge of the Caribbean plate to the east, while the islands of the Greater Antilles mark its northern edge. This tectonic setting adds seismic, tsunamigenic and volcanic hazards to the region. This broad geographic extent of the Caribbean provides the environment for a number of natural hazards, that either cannot be avoided or whose effects cannot easily be prevented.¹

The geology, tectonic setting, location and topography of Caribbean countries, including the OCTs, in this evaluation, expose them to a variety of hazards; poor land use and environmental management practices often exacerbate the effects of these hazards. The region is at threat from tropical cyclone activity, floods, volcanic and seismic activities, droughts and bush fires, in addition to transportation and industrial accidents and epidemiological threats.

Over the last 30 years there has been an increasing trend of loss of life and damage from hazards. Analyses conducted by the United Nations Economic Commission for Latin

¹ Disaster Risk Reduction Centre, University of the West Indies, 2010. Caribbean Implementation of the Hyogo Framework of Action: HFA Mid Term Review. UNDP

America and the Caribbean (UNECLAC) show that hurricanes have caused approximately US\$5.7 billion in damage. In 2004, a year in which seven countries were affected by hurricanes, there was approximately US\$2 billion in damages. Significantly, for two of those countries, the Cayman Islands and Grenada, losses were more than 100% of each country's gross domestic product (GDP).²

The region is highly prone to natural hazards. The major climatic hazards of the region are strong winds and heavy rains associated with the annual formation of tropical depressions, storms and hurricanes, often giving rise to floods. Storm surges often linked to the passage



Figure 3: Ash fall from the Soufrière Hills volcano in Montserrat

Credit: UWI

Figure 4: Passage of Hurricane Ivan over the Cayman Islands, 2004

Credit: david@davidwolfephotography.com

of storms and hurricanes result in coastal flooding. Volcanic eruptions are added concerns for the islands of the Lesser Antilles. Soufrière Hills in Montserrat is the region's longest erupting volcano, starting in 1995 and continuing to the present. This caused the displacement and emigration of more than half of the population, and relocation of the capital and residential areas to the north of the island.



Tectonic and volcanic earthquakes are a common occurrence in the Caribbean region having



Figure 5: Landslide in the BVI

Credit: James Joyce

magnitudes ranging from 3 to 7+ on the Richter scale. The threat of sea level rise related to global climate change is an additional hazard that Caribbean territories must plan for. Coastal erosion slowly yet inexorably threatens the human and economic activities of the heavily populated coastal zones of Caribbean territories.

² UNECLAC, 2004 *Preliminary Overview of the Economies of Latin America and the Caribbean*. Available from: <http://www.eclac.cl/publicaciones/xml/0/20480/lcg2265i.pdf>. [Accessed on December 21 2012].

Landslides, debris flows, and rock falls are triggered by heavy rains. Territories that possess steep and rugged topography are particularly prone to landslides, which are often exacerbated by road cuttings and land clearance for settlement or agriculture.



On-shore and off-shore oil spills, transport of nuclear waste in Caribbean waters, storage and transport of hazardous chemicals, and toxic release of chemicals are some of the major technological hazards Caribbean countries are likely to face. Overall, the Caribbean region is prone to climatic, tectonic, and technological hazards.³

Figure 6: An oil-smudged pink flamingo stands at the Jan Kok nature preserve in Curaçao, August 2012

Credit: Smoc Curacao Environmental Group

This vulnerability was highlighted by Jovel⁴ who reported that over the period 1846-1978, thirty four percent (34%) of all recorded disasters occurred in the Latin America-Caribbean region, and caused over one million deaths.

As shown in Table 1 all of the R3i participating states are prone to impact of hurricane storm and wind, tsunamis, chemical, technological, and biological hazards. Earthquake, Drought, fire, and flood are the next from of hazards that affects 80% of the R3i participating states. Volcanic and landslide hazards are peculiar to 50% of the islands.⁵

Table 1: Types of Hazards that the Caribbean OCTs are prone to.

	ARU	CUR	BON	SAB	EUX	SMX	AXA	BVI	CI	TCI	MNT
Earthquake hazards	x	x		x	x	x	x	x			x
Volcanic hazards				x	X		x	x			x

³ Disaster Risk Reduction Centre, University of the West Indies, 2010. Caribbean Implementation of the Hyogo Framework of Action: HFA Mid Term Review. UNDP

⁴ R. Jovel: Natural Disasters and their Impacts on the Social and Economic Development of Central America and the Caribbean, 1982. International Congress on Urban Emergencies, Cancun, Mexico

⁵ GESp – CGS/EI - GIS4C Joint Venture, 2011. Synthesis of Hazard Mapping and Vulnerability Assessment in Support of Disaster Risk Management in the Caribbean OCTs. R3i Contractor's Report.

	ARU	CUR	BON	SAB	EUX	SMX	AXA	BVI	CI	TCI	MNT
Landslide hazards	x	x	x	x	x	x	x	x	x	x	x
Flood hazards	x	x	x	x	x	x	x	x	x	x	x
Drought hazards	x	x	x	x	x		x	x	x	x	x
Hurricane wind hazards	x	x	x	x	x	x	x	x	x	x	x
Storm surge hazards	x	x	x	x	x	x	x	x	x	x	x
Chemical hazards	x	x	x	x	x	x	x	x	x	x	x
Biological e.g. epidemics, agricultural pest	x	x	x	x	x	x	x	x	x	x	x
Technological	x	x		x	x	x	x	x	x	x	x
Tsunamis	x	x	x		x	x	x	x	x	x	x
Fire	x	x	x	x	x	x	x	x	x	x	x
Civil unrest	x	x	x	x	x	x	x	x	x	x	x

Based on the foregoing, the challenges to the OCTs and the rest of the Caribbean region to comprehensive disaster management can be summarised as follows:

- The islands are small, with limited natural resource bases, there is high competition between stakeholders for land use, there is intensity of land-use, and immediacy of interdependence in human-environment systems spatial concentration of productive assets.
- They are relatively inaccessible compared to continental land masses with accompanying high external transport costs, time delays and high costs in accessing external goods.
- Their isolation can result in delays and reduced quality in information in a crisis.
- Most of the islands have exposed interiors and narrow coastal zones.
- Their small populations and increasing population concentrations on coastal zones lead to higher risks of serious damage and high per capita costs for infrastructure and services. Conversely, their small economies with high dependence on tourism and related tourism development make them vulnerable to socio-economic pressures that are often at odds with sound disaster mitigation and climate adaptation strategies.
- Most islands have limited hazard forecasting ability and less capacity to respond to serious disasters.
- Their small economic footprint in their mother countries
- At the same time, however, due to their proximity to the sea and the affiliated vulnerabilities, islands and coastal zones display similar characteristics. The development of hazard assessment, warning and remediation systems on one island can yield lessons for all coastal zones and be applied to others.

Disaster risk management in the region is also faced with the following obstacles:

- Inadequate level of human and technical, and financial resources
- Inadequate political commitment
- Inadequate enforcement of existing laws with regards to planning approvals

- Slow rate in the changing culture from disaster response management to risk reduction

2.2 Public Sector Response to challenges

The B-Tool evaluations undertaken in 2010⁶ indicate that the OCTs have a “good” overall rating for the six phases of comprehensive disaster risk management. OCTs in the northern Caribbean which have had more experiences with hurricanes (e.g. Anguilla and Cayman Islands) show greater capacity overall than those that have not had as frequent or damaging impacts from hurricanes. Montserrat, which has had an active volcano for some years, has a very strong disaster preparedness regime. By contrast the ABC islands (Aruba, Bonaire and Curaçao) are not exposed to natural disasters very frequently and thus did not previously feel a pressure to have strong investment in disaster management capacity, although the emergency response mechanism in the Dutch OCTs has very strong inter-agency coordination and support.

All countries have a national structure and institutional arrangements for disaster risk management (DRM). In general, the structure consists of a multi-sectoral national committee or council, and a government office charged with the responsibility for DRM. Nevertheless, the Dutch and UK OCTs have very different governance and operational mechanisms as they relate to disaster risk management and regional cooperation.

Whereas the British OCTs have dedicated disaster management offices, the Dutch OCTs typically have a system where the Fire Chief serves as the national disaster management coordinator, with a highly integrated multi-sectoral system of Emergency Support Function (ESF) groups. For the most part these agencies have limited human and technological capital. The officers are, however, dedicated to and specialised in their respective fields and have good understanding of their respective and interlinked roles in the disaster management system.

The Dutch OCTs are not part of any regional grouping but due to the fact that they are part of the Dutch Kingdom assistance can be requested from

Box 2

Disaster Management in Sint Maarten

A policy plan was drafted for the Netherlands Antilles to improve disaster management on the islands and to strengthen the fire departments that form a central role in this system. As a continuation of this general policy plan a special policy plan was drafted for the improvement of the Sint Maarten fire department.

The Island Council of the territory approved the Island Ordinance Disaster Management (“Eilandsverordening Rampenbestrijding”) in 2000. This Ordinance regulates the responsibilities of the Island Government for disaster preparedness, the command structure during an actual disaster and the requirements for disaster plans, amongst other things.

Based on this ordinance the Island Council approved the Disaster Plan for the Island Territory of Sint Maarten in 2002. This plan is a general plan, which outlines the responsibilities of the various partners in the disaster management organization.

At present the Prime Minister has the supreme command during a disaster. She is assisted by the fire chief, who is the National Disaster Coordinator and a Disaster Advisory Council (Eilandelijke Rampenstaf) consisting of 10 Emergency Support Function coordinators. This council advises the Prime Minister on all matters concerning disasters, including prevention, preparedness and mitigation.

⁶ Disaster Management Capacity Assessment Report - EXECUTIVE SUMMARY

Box 3

Disaster Management in the Virgin Islands

The Department of Disaster Management (DDM) originated in the Office of the Deputy Governor in 1983 with a Desk Officer. Prior to this time, disaster preparedness amounted to a very rudimentary hurricane plan and an annual meeting of the National Emergency Advisory Committee, chaired by the Deputy Governor, to discuss the state of preparedness for the hurricane season. There was no national disaster organization as such, a skeleton communications system between islands, not even trained shelter managers.

It became an independent department in 1990 with the employment of its first full-time Disaster Preparedness Coordinator. Initial operations concentrated on the preparedness phase of the disaster management cycle until the strategy shifted to comprehensive disaster management thereby encompassing preparedness, prevention, mitigation, response and recovery. Today the DDM is one of the leading National Disaster Organizations in the region.

The Governor has overall responsibility for disaster management in the Virgin Islands. He serves as Chairman of the National Disaster Management Council (NDMC) and is primarily responsible for pre-disaster and response activities. The Premier serves as Deputy Chairman and he is primarily responsible for mitigation and recovery activities.

The DDM has 13 different functions spread over 6 different programme areas. In 2011, the DDM had a staff of 11 persons.

Source: 2011 Annual Report

the each other, the Royal Dutch Marines based in Aruba and the Kingdom Government in the Netherlands.

The UK OCTs, with the exception of the Cayman Islands, are all part of a wider regional disaster management network coordinated by the Caribbean Disaster Emergency Management Agency (CDEMA). As participating states of CDEMA, these OCTs have access to different sources of donor financing and to a range of regional programmes. Most importantly all the English Speaking OCTs subscribe to the Comprehensive Disaster Management (CDM) Strategy. The CDM Strategic Framework which is consistent with the Hyogo Framework is being coordinated in the region by CDEMA, supported by a wide range of regional institutions (e.g. Caribbean Development Bank, Caribbean Tourism Organisation, University of the West Indies), multilateral agencies (UNDP, PAHO), and funding organisations (EC, DfID, CIDA, USAID).

2.3 Organisational Involvement in the Caribbean

There are a plethora of organizations involved in disaster assessment and mitigation in the Caribbean. Thus, R3I needed to build linkages with regional and international agencies and other regional initiatives to take advantage of the synergies between them in order to enhance the effectiveness and impact of the work. These include the WMO, CIMH, CDEMA, and UNESCO-IOC; and projects such as Enhancing Resilience to Reduce Vulnerability in the Caribbean, CARIBE TCHEWS, and CDEMA's flood and tsunami warning protocols projects.

The R3I also coordinated with partners in the French WI, where there are strong capacities in civil defence, GIS-integrated planning, hazard monitoring and detection.

A number of projects had either been completed or were on-going when R3I was initiated. Inter alia the following initiatives are noted:

- UNESCO-IHE was working with Sint Maarten on inland and coastal flood hazard mapping and modelling, including enhancing local GIS capacities to use these tools. This improved risk information will feed into warning systems and land use planning.
- The Eastern Caribbean Donor Group for Disaster Management (ECDGDM) - through which all development partners in Barbados and the OECS work to respond quickly and effectively when a disaster strikes. The ECDGDM is led by the United Nations.
- The premier disaster management platform in the Caribbean is CDEMA with its 18 participating states. CDEMA's annual CDM Conference continues to play a leading role in the sharing of best practices and the strengthening of networks amongst relevant professionals in the Caribbean.
- The European Commission supports disaster risk reduction in developing countries consistent with the Hyogo framework for action that intends to build the resilience of nations and communities to disaster.
- The Pan-American Institute of Geography and History (PAIGH) based in Mexico City executed a major project (funded by the International Development Research Council of Canada, IDRC) for preparing Seismic Hazard Maps for Latin America and the Caribbean.
- Over the past forty-seven years a considerable amount of research has been carried out on the seismicity of the Caribbean by the Seismic Research Centre (SRC) of The University of the West Indies (UWI).

2.4 Island Independence versus Regional Co-operation

The R3i objective to use a regional platform to respond to national needs is laudable and there are many lessons to be learned.

Caribbean islands, while similar in so many facets of being small island States, are also very nationalistic and prone to inter-island rivalries. More importantly, as had become clear during the various assessments undertaken by the Project:

- Although the islands share many of the same characteristics that make them disaster prone, their individual priorities are different. For example, Montserrat is acutely aware of its vulnerability to volcanic activity while Sint Maarten experienced severe flooding in 2005 and has therefore spent much effort at developing inland and coastal flood models and maps. Similarly, the BVI's outer island has suffered considerable economic loss through storm surges and thus this territory was keen on acquiring the data and decision support systems for managing these storm surges.
- Capacities of the National Disaster Offices throughout the OCTs are at different levels in terms of human, technical and financial resources.
- Within some islands, there are issues of inadequate co-operation between government departments and there is also inadequate capacity to work with the technological requirements of new systems, as say, Common Alerting Protocols (CAP).

R3I: A regional project with a national response.

Box 4

“Nationalising” a regional project

- The UNDP attempted to leverage the advantages of regional and international information and expertise sharing and to build on previous local initiatives while attempting to develop a comprehensive system of disaster management for the targeted OCTs.
 - The UNDP identified local focal points to oversee project work on their respective islands. These Focal Points were also involved, to the extent possible, in project decision making.
 - The UNDP organized a number of forums where information could be shared amongst experts and island staff working on the project. Some of the forums were run concurrently with annual CDEMA conferences to allow participants to attend other sessions outside of the R3I venue
 - The UNDP hired technical experts to work with the islands to develop their local priorities and then hired technical experts and quality assurance staff to help develop the planned initiatives, provide equipment and computer technology to support new systems and train staff.
-

- While there has been inter-island cooperation between the UK OCTS – through CARICOM, CARIFORUM, CDEMA and OECS, to mention a few – the inter-island cooperation between the Dutch and UK OCTs did not exist prior to the Project.

- For some OCTs their historical allegiances are with their mother countries rather than with other Caribbean countries.

In all, the differences in capacities; the differences in the types of disasters that were important to the territories; the differences in the governance structure for disaster management; the differences in exposure to comprehensive disaster management; and the differences in rate of participation in regional institutions and programmes can pose as significant challenges to implementing regional projects in the Caribbean. These challenges have not however precluded agencies such as CARICOM, OECS, CEHI, CDEMA, to mention a few, from implementing quite successful regional projects. Given the small size of Caribbean countries and the inadequate expertise available at the national level, regional projects make economic sense; they allow for economies and efficiencies of scale and provide countries the opportunity to participate in and gain from pooled resources. However, based on experiences, including from this 3Ri project, it is important to recognise that all countries participating in a regional project will not operate from a level playing field, and will have different needs and expectations. The ability to manage these varying needs and expectations is very much an integral part of coordinating and facilitating the project as it is in ensuring that the outputs are delivered on time and within cost.

CHAPTER 3

3.0 UNDP RESPONSE AND THE CHALLENGES

3.1 Description of the Project

This project seeks to address the risk and exposure of the OCTs by providing a network of regional infrastructure, programmes, policies and protocols to strengthen their capacity to predict and prepare for natural and human-induced hazards, and thus improve resilience and reduce risk and subsequent loss. The R3i emphasises intra-regional learning and sharing of tools, knowledge and best practices to enhance the territories' individual and collective capacities.

The R3I is the first of its kind in addressing the specific disaster management needs of the British and Dutch OCTs. The project is driven by the perspectives and needs articulated by the disaster management communities in these islands, focusing on the specific areas of hazard mapping and vulnerability assessment, early warning systems, and rescue, response and recovery capacities. Another important aspect of this project is its efforts to activate and strengthen the cooperation between these islands as well as the wider region. By the end of the project it is expected that there will be:

- i. Increased capacity in hazard mapping and associated vulnerability assessments, to be further incorporated into spatial information systems to inform planning and development processes
- ii. A regional early warning systems (EWS) pilot for the OCTs, based on the ITU automated alert protocol for warnings
- iii. Capacity built in response, rescue and recovery, in order to shorten recovery periods through the use risk assessment and mitigation practices for development planning
- iv. Strengthened local disaster management structures and capacities in terms of tools and best practices to support comprehensive disaster risk management
- v. Greater cooperation and coordination between the OCTs, with documentation and dissemination of best practices

The results were to be achieved through 5 Outputs. The activities undertaken in each of the Outputs is presented in the series of tables below.

3.1.1 Output 1- Capacity of OCTs in comprehensive disaster risk management in relation to hazards mapping and vulnerability assessment increased

Sub-component	Activities undertaken
<i>Capacity and needs assessment and mapping of existing initiatives in HM/VA</i>	<p>Capacity and data needs assessment undertaken for Aruba, Bonaire, Curacao, Cayman Islands, TCI, Montserrat, Saba and Sint Eustatius</p> <p>An assessment of the detailed data, hardware, software and human resources needs in relation to GIS and hazard mapping was undertaken. The report includes a synthesis of relevant existing studies and initiatives.</p>
<i>Development/updating of HM/VA</i>	<p>Coastal and inland flood modelling and vulnerability assessment: Sint Maarten</p> <p>A nearshore bathymetric survey has been completed, using an innovative and economical technique correlating jet-ski sonar surveys with satellite images (NASA EO1 multispectral scanner). Based on the data acquired, inland and coastal inundation models have been set up.</p> <p>Geodetic and aerial survey: Anguilla</p> <p>A LiDAR aerial survey has been completed for the entire island. A geodetic survey was also conducted, and a new reference network established. Data have been used to produce a high resolution terrain model (3D with buildings), orthophotography and GIS layers. The data produced will be used by Anguilla to produce flood hazard maps and models, select warning areas, conduct hazard, risk and vulnerability assessments, and provide a damage assessment baseline.</p> <p>Dr Zoran Vojinovic (UNESCO-IHE) did a preliminary examination of the flood hazard risk in Anguilla, noting several low lying areas and land locked basins as high risk areas, and the vulnerability of critical infrastructure.</p> <p>Dr Aurelio Mercado (University of Puerto Rico; R3I technical expert on coastal hazards) was requested to try to determine the origin of large boulders on Scrub Island and along the Anguillian coast to assist with the definition of the risk profile of the island and subsequent development and risk management planning.</p> <p>Tsunami and storm surge modelling and hazard mapping: Virgin Islands</p> <p>The VI has received a collection of topographic and bathymetric data for Tortola, Virgin Gorda, Anegada and Jost Van Dyke. It has also received tsunami and storm surge models. Up to the time of the conduct of the evaluation, the contractor has not delivered quantitative hazard maps that should provide the required details of the storm surge amplitudes and inundation limits for the Saffir Simpson scale Categories 3, 4 and 5 events and for selected return period events, for the specified coastal areas. The DMD will undertake to develop these maps. This would feed into the national GIS structure and inform future risk mitigation in development planning. The VII has received technical assistance from UNESCO IHE for landslide hazard assessment and development of slope cut maps</p> <p>The flood modelling is presently being done with support from UNESCO based on the work that was undertaken, through R3I, in Sint Maarten Aruba, Bonaire, Curacao, Cayman Islands, TCI, Montserrat, Saba and Sint</p>

Sub-component	Activities undertaken
Capacity development of OCTs in application of HM/VA	<p>Eustatius: Data collection for the structural vulnerability assessment studies and the mapping of oil storage facilities were undertaken in the Cayman Islands and the TCI Detailed quantitative risk assessment and loss estimation studies were undertaken in the Cayman Islands (meteorological and associated risks) along with socio assessments</p> <p>Regional GIS regional training sessions (Aruba, Bonaire, Curacao, Cayman Islands, TCI, Montserrat, Saba and Sint Eustatius):</p> <ul style="list-style-type: none"> · Introduction to GIS (20 trainees) · Field data collection (22 trainees) · Editing and managing spatial data (22 trainees) <p>National GIS training session (Sint Maarten, with participation by Anguilla and BVI): GIS and Remote Sensing for Infrastructure Management and Disaster Risk Reduction (19 trainees) National GIS technical assistance (Anguilla): integration of new and existing geospatial data into new GIS database and projection, data management, and support calculation of imperial measurements in the transportation and grid data layers</p>

Output 1 is the main priority of many of the OCTs, having a focus on mitigating risk, and being applicable beyond disaster management into land use and development planning for reducing future vulnerabilities. Therefore the scope of the activities articulated had a high emphasis on data collection in order to develop HM and VA, and provision of requisite training, equipment and software to build local capacities.

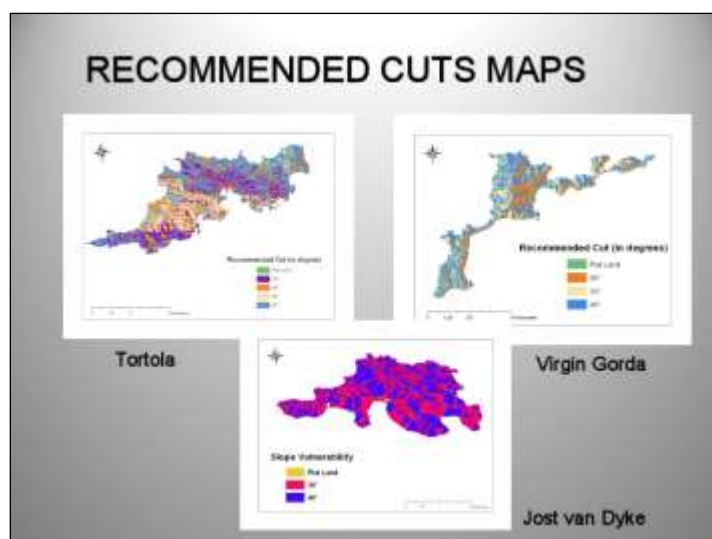


Figure 8: Sint Maarten – Experiments in Bathymetric Surveying and use in Coastal Modelling
Source: R3i Project

The acquisition of some detailed datasets to be able to develop hazard models was one of the most costly components. Consequently, activities in Output 1 took up a substantial amount of the resources. According to the project's revised 2012 budget, the cost of this output was estimated at USD 2,145,419.40

Figure 7: BVI Cut Slope Stability Maps

Source: R3i Project

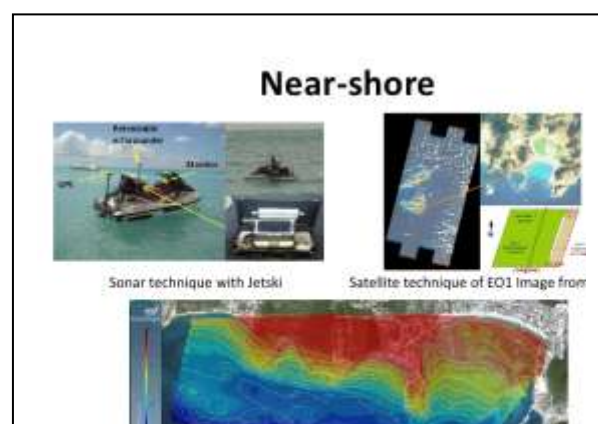




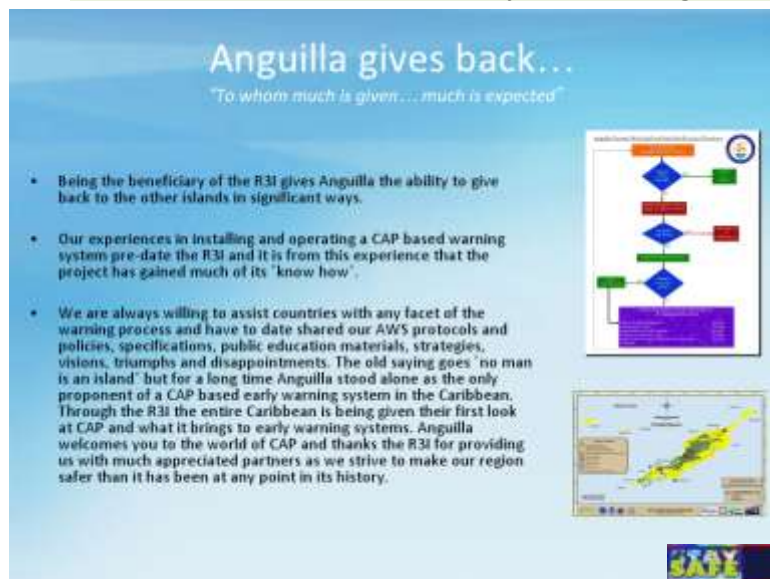
Figure 9: New Aerial Survey of Anguilla

Source R3i Project

3.1.2 Output 2 - Early warning system feasibility study and pilot implemented

Sub-component	Activities undertaken
<i>Assessment and Pilot design</i>	<ul style="list-style-type: none"> Assessment of the early warning capabilities in each OCT was completed using inter-country support and technical consultants. Reports on “Policy and planning” and “System design and validation – concept” have been delivered for each country and are being revised. The country and technical consultation processes were completed for definition of the activity. The complex nature of the early warning system necessitated consultation of a wide range of stakeholders at national and regional level, and work in several complementary fields for developing the scope of the activity: legal and procedural matters; hazard forecasting; technologies for detection and Telecommunication; coordination of response; public awareness and media relations; etc. A 4-country all-hazard alerting systems pilot has been designed through in-country consultations and technical support for drafting the technical requirements and specifications, which are based on the international Common Alerting Protocol (CAP) standard, building on the experience of Anguilla with this system since 2007. Each country selected a priority component to pilot as follows: Anguilla – tsunami, cable interrupt Aruba – notification of emergency responders Montserrat – volcano, sirens Sint Maarten – flood, sirens and automated rain gauges
<i>EWS implementation</i>	<ul style="list-style-type: none"> Documentation and analysis of existing legislation, policies and procedures and technical assistance to improve the “soft” components of the EWS Installation and testing of server equipment and CAP 1.2 software Design of model policy and protocols, templates of alerting messages, public outreach and educational material which benefited all OCTs Provision of ancillary hardware for the sirens in Montserrat. Provision of hardware as follows: <ul style="list-style-type: none"> 4 CAP servers (MNI; SXM; AXA and ARU) 15 radio interrupt devices (6 in AXA; 1 in MNI; 4 in ARU and 4 in

Sub-component	Activities undertaken
	<p>SXM)</p> <ul style="list-style-type: none"> - CAP-siren interface in SXM - CAP-siren interface in MNI - 75 Smartphones in ARU for first responders - Smartphone notification platform (CAP – Cloud based) for first responders in ARU. - 194 alert receivers in AXA (marine radios), with transmitter and CAP-converter - RDS enhancement hardware in MNI, allowing all RDS receivers in MNI to receive alerts. <ul style="list-style-type: none"> • Based on identification of a need for a mechanism to receive tsunami alerts and provide hydromet alerts as redundancy to the off-island meteorological services, 11 Emergency Managers' Weather Information Network (EWMIN) systems were provided to all OCTs and training on installation and operation to 15 country representatives in cooperation with UCAR JOSS. • Coordination continues with other ongoing activities in the field of EWS, and in particular with UNESCO-IOC (on tsunami hazards) and WMO (on hydrometeorological hazards).



Anguilla gives back...
"To whom much is given... much is expected"

- Being the beneficiary of the R3i gives Anguilla the ability to give back to the other islands in significant ways.
- Our experiences in installing and operating a CAP based warning system pre-date the R3i and it is from this experience that the project has gained much of its 'know how'.
- We are always willing to assist countries with any facet of the warning process and have to date shared our AWS protocols and policies, specifications, public education materials, strategies, visions, triumphs and disappointments. The old saying goes 'no man is an island' but for a long time Anguilla stood alone as the only proponent of a CAP based early warning system in the Caribbean. Through the R3i the entire Caribbean is being given their first look at CAP and what it brings to early warning systems. Anguilla welcomes you to the world of CAP and thanks the R3i for providing us with much appreciated partners as we strive to make our region safer than it has been at any point in its history.

Designing the activity was cost effectively completed through the mutual support of the OCTs sharing national capacities, as well as technical expertise retained by the project for quality assurance.

Figure 10: Anguilla Warning System – First Class CAP Experience
Source: R3i Project

To pioneer different applications within the Common Alerting Protocol (CAP) system e.g. multilingual alerts, and to enable development of the first multi country integrated warning system to provide mutual redundancy, the project included 4 pilot OCTs. This resulted in the allocated budget increasing from USD 495,000.00 to USD 845,559.66. Equipment to complete the pilots was the cause of the budget increase.



Figure 11: Communicating the Early Warning/Alerting System
Source: R3i Project

An important feature of this Output that is worthy of mention that the four countries that participated in the multi country integrated warning system were at various stages of development of EWS. By the end of the project all 4 countries had full CAP EWS capability.

Another important deliverable of this output was the multi lingual public outreach and educational materials that have been developed for use by all the countries.

Curacao and Sint Maarten have become members of UNESCO-IOC to enable their participation in the UNESCO-IOC ICG Tsunami and Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS).



Figure 12: Public Outreach and Educational Material Produced by the Project
Source R3i



Figure 14: A Regional Network of Emergency Warning Systems – The first of its kind in the Caribbean
Source: R3i Project

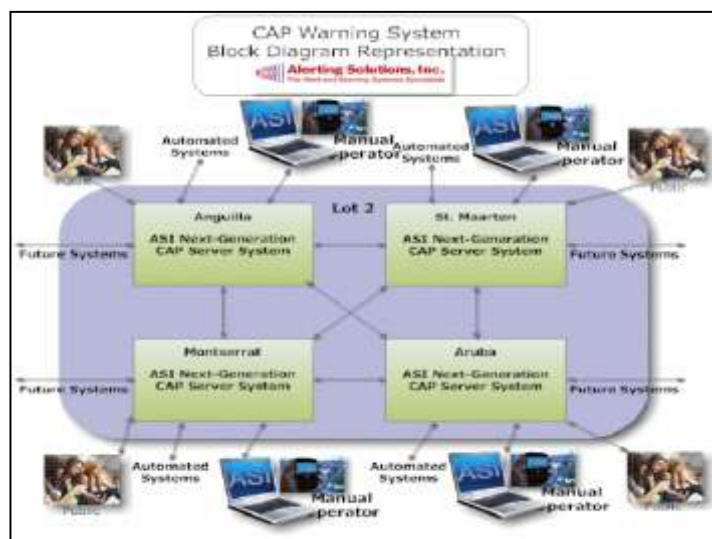


Figure 13: Making Warnings Work
Source: R3i Project

3.1.3 Output 3 - Capacity built in response, rescue and recovery

Subcomponent	Activities undertaken
<i>Formulate and develop a plan for RRR systems based on review</i>	<p>The 2010 B-Tool assessments and additional consultation with Technical Management Team 3 (TMT 3) led to the identification and prioritisation of needs in the following areas:</p> <ul style="list-style-type: none"> • Emergency telecommunications: communication systems, testing and backup systems for national Emergency Operations Centres (EOCs) and critical facilities • Search and rescue capacity: training, certification and provision of light equipment • National asset register (logistical supply management) • Training in: hazard-resilient construction, oil spill and hazardous materials management, recovery planning, relief distribution and shelter management, EOC management, business continuity management (BCM), damage and needs assessment, debris management • Risk transfer
<i>Capacity development of OCTs in RRR</i>	<p>Urban search and rescue (USAR): training and equipment have been provided at “light” level as defined by INSARAG for Aruba and Curacao. The programme consists of three phases:</p> <ul style="list-style-type: none"> • I: Inception and design – review of national SAR structures and current capacities and design of SAR team composition and training programme • II: Training, assessment and certification, and supply of equipment • III: Systems for continuity and improvement – SOPs, testing programme, training strategy • SAR activities were held in 2012 for Bonaire, Cayman Islands, Saba, Sint Eustatius and TCI. • Phase I has been completed in Sint Maarten. <p><u>Telecommunication:</u></p> <ul style="list-style-type: none"> • Montserrat’s telecommunication systems had been assessed by BVI’s Department of Disaster Management communication officer, Motorola and Danimex. Additional assistance was also provided by the Disaster Management Department in the Cayman Islands. The Montserrat National Telecommunication Committee also played a key role in guiding development of the most appropriate solution which balanced performance, operating cost and maintenance complexity. 5 operators received technical operations and maintenance training in Grenada. • Equipment has been acquired to upgrade Anguilla’s telecommunication system. Equipment was also purchased for Aruba and Curacao. <p><u>Shelter Management</u></p> <ul style="list-style-type: none"> • 6 countries received training in shelter management from experts from the BVI. <p><u>Business Continuity Management</u></p> <ul style="list-style-type: none"> • Online Business continuity training provided through the Lavity Stoutt Community College in the BVI: 54 trainees registered > 48 effectively participated > 38 completed the training > 31 obtained the certification of Continuity manager. <p><u>Oil Spill Management</u></p> <ul style="list-style-type: none"> • Oil spill management: REMPEITC (UN agency), based in Curacao, is updated each country’s status concerning their oil spill

Subcomponent	Activities undertaken
	preparedness. In Aruba, the National Oil Spill Contingency Plan (1993) has been updated and 25 senior managers and first responders received Introductory OPRC (International Convention on Oil Pollution Preparedness, Response and Cooperation) training.

Time and budget constraints inhibited implementation of all activities identified. Although priority had been given to the implementation of telecommunication improvements and capacity building in search and rescue and oil spill management. TCI and BVI did not receive their telecommunications equipment. Furthermore, activities related to recovery planning and risk transfer were canceled.

A total of USD 1, 020,000 had been budgeted for this output. However only USD 766,785.19 was actually spent. Savings were realised through the sharing of in-country expertise between countries: The BVI provided 6 technicians to provide training in search and rescue; Anguilla provided a technician to assist with installation of equipment for EWS, etc.



Figures 15 & 16: Training in Urban Search and Rescue Team Development
Source R3i Project



Figure 17: Oil Spill Contingency Training
Source: R3i Project

3.1.4 Output 4 - Strengthened OCT disaster management structures and effective implementing agencies

Subcomponent	Activities undertaken
<i>Support to OCTs</i>	Facilitating participation in regional and international fora. Countries have been able to mutually support each other through exchange of experience during regional meetings, and also through specific missions from country specialists to other islands. Provision of technical and administrative resources: all OCTs
<i>Support to Implementing Agencies</i>	Technical expertise was provided in the areas of coastal and hydrological hazards mapping and modelling, vulnerability assessment, including social assessment geological hazards, alerting systems and telecommunication. Input by these experts occurred at several levels, including: <ul style="list-style-type: none"> • Providing technical inputs to the drafting of technical specifications and Terms of Reference, and subsequent participation in evaluation of proposals • Technical monitoring and quality control of contractors' deliverables • Direct deliverables to beneficiary countries such as: <ul style="list-style-type: none"> ○ Preliminary flood hazard maps: Anguilla ○ Slope vulnerability maps and recommended cut map: VI ○ Quantitative risk assessment and loss estimation studies in the Cayman islands ○ Geologic hazard assessment: Saba and Sint Eustatius ○ Initial assessment of EWS capacity: Anguilla, Aruba, Curacao, Montserrat and Sint Maarten

Through Output 4 partnerships were developed with UN specialised agencies, regional institutions and other development partners to implement specific activities or create synergies to increase the impact of various activities. Of particular relevance were the partnerships with UNESCO-IHE, NASA, REMPEITC, and WMO to mention a few.

These collaborations have allowed some activities to be implemented at a significantly reduced cost, by world class experts and according to international standards. Thus it is not surprising that only about a third of the funds that were allocated (USD900, 000) to this Output were finally utilised (USD354, 258.98).

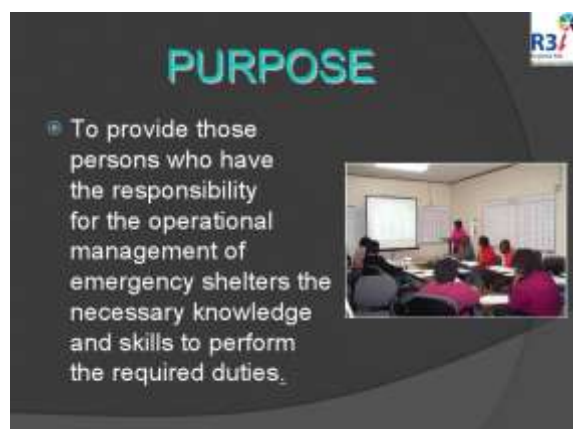


Figure 18: South-South Cooperation – Training provided by the BVI in Shelter Management

Source: R3i Project

3.1.5 Output 5 - Coordination, training, dissemination

SUBCOMPONENT	ACTIVIITES UNDERTAKEN
<i>Coordination and planning</i>	The project team operated to implement sustainable results in each country, with occasional logistical support assistance. The team continued the design, implementation and monitoring of all activities including formulation of Terms of Reference, technical specifications and all procurement documents, contract monitoring and progress reporting. Project Board meetings and TMT meetings were convened.
<i>Training and dissemination</i>	Documentation and dissemination of best practices. <ul style="list-style-type: none"> • UNDP provided updates on progress through its website and news releases. • A video documentary was created covering project activities in various OCTs to date, which captured the work undertaken, particularly in HM/VA, EWS and SAR. • Reports on each component of the project were produced and disseminated. • A Facebook page was created and to allow more informal communication on the project and the sharing of events, articles, photos and videos.

Extensive procurement approval processes at the regional and HQ levels led to a delay in the expected start of several contracts, specifically in HM/VA, EWS and SAR. Accelerated implementation plans, however, mitigated this impact. In its comments to this Evaluation Report the UNDP notes that their procurement processes are indeed this has proven necessary and has provided the transparency and accountability that both donors and beneficiaries demand.

Training in oil spill management and development of national response plans was hindered by the lack of response by countries to REMPEITC to specify their needs. The training allowed the participants to complete their knowledge on Oil Spill Response by applying it to an Oil Spill scenario in their country. In Anguilla, for instance the training focussed on 4 areas:

- i. Estimation of Oil Trajectory and Fate
- ii. Defining Environmental and Human Resources at Risk
- iii. Defining Spill Response Options for Consideration
- iv. Defining the Tactics and Critical Success Factors for the Response Options

The training was offered in 4 countries and was very well received by all the participants.

Finally, there are 3 examples of adoption and/or sharing of good practices provided by the project. These include:

- Implementation of the Common Alerting Protocol (CAP) for EWS
Initially adopted by Anguilla in 2007, the CAP standard is being adopted by Sint Maarten, Montserrat and Aruba under Output 2, with further expansion of the capabilities in Anguilla. This was delivered through the template protocols and Standard Operating Procedures (SOPs) to be used by all beneficiaries. These can be used beyond the OCTs.

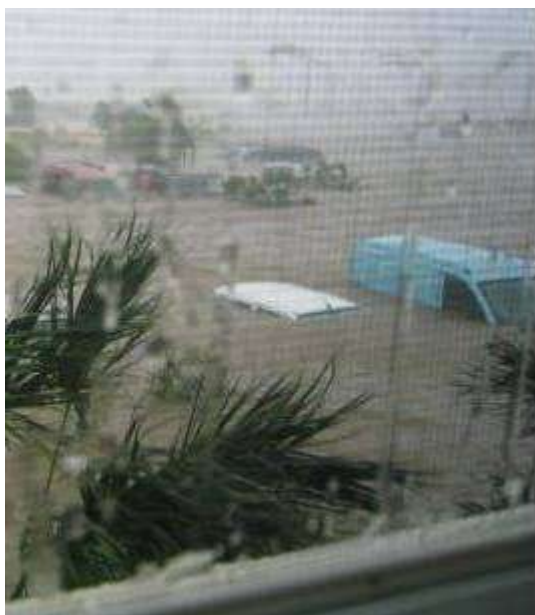
- Bathymetric data collection.

Although BVI did not replicate the Sint Maarten bathymetric data collection, there is much scope for transferring this innovative bathymetric data collection technique which may pave the way forward for affordable bathymetric surveys in the Caribbean. This will indeed allow for more cost-effective and widespread coastal hazard modelling to inform development planning and resilience retrofitting in the region.

- Adoption of INSARAG guidelines for search and rescue operations. R3I extended a programme to develop search and rescue capacities to the OCTs, adopting the International Search and Rescue Advisory Group (INSARAG) Guidelines and PAHO-developed courses. This reflected a similar initiative coordinated by CDEMA and USAID for CDEMA Participating States. Previously, the OCTs were not able to benefit from this initiative directly because their status prohibited receiving assistance from USAID.

Box 5

Experts to map Cayman infrastructure hazards



The Overseas Countries and Territories R3i - Regional Risk Reduction Initiative - is holding a conference in the Cayman Islands next week examining the risks face by small islands in the region. Experts will be examining the achievements and progress of R3i to date but they will also be focusing on the potential hazards on Grand Cayman and mapping critical buildings and infrastructure. With funding provided by the European Union R3i looks at strategies to address these potential hazards brought about by climate change and the risks faced by low lying coastal areas.

Source:

<http://www.caymannewsservice.com/science-and-nature>

The CDM Conference was also an avenue used to share with the regional DM community about the expansion and innovation in the CAP EWS as a best practice, in which there was substantive interest, including from Bonaire and Curacao which were keen to accelerate their implementation even though they were not pilot countries.

REMPEITC facilitated an oil spill response training exercise in the BES islands (Bonaire, St Eustatius, Saba), sponsored by the Government of the Netherlands, which included the deployment of a Current Buster. R3I supported participation of persons from Aruba, Anguilla, Montserrat, St Maarten and Turks and Caicos Islands.

Replication of the experience in BVI in developing cut slope maps for reducing risk of landslide and slope failure as a result of infrastructure works or shoreline erosion is ongoing in Sint Maarten and Anguilla. These maps are to be used by private and government developers to guide cutting of slopes to minimise destabilisation due to over steepening.

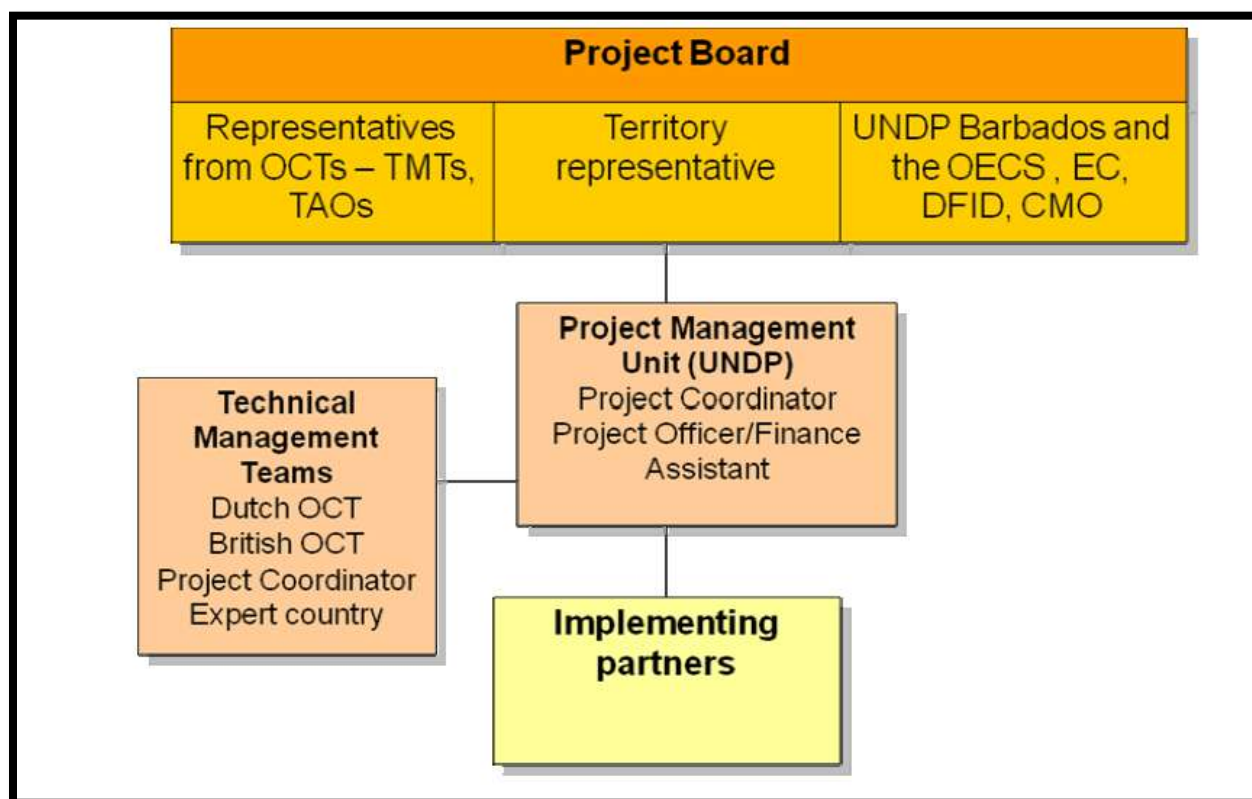
3.2 UNDP'S Role in Project: Implementation

The coordination of this project was undertaken by a small team of 2 persons in the UNDP. Although this team had access to the resources of the UNDP Office for Barbados and the Eastern Caribbean, it was no simple feat to coordinate 3 types of highly technical outputs; manage 10 participating countries, each with its own needs and priorities and internal capacities; and manage a large cadre of contractors who themselves were part of consortia and who were, in the main, serving multiple countries. Although at the time of undertaking this evaluation some services were still being delivered and some deliverables had to be cancelled, this very overly ambitious project is on its way to meeting its objective of increasing the capacities for disaster risk management of the participating states.

A good word also needs to be said of the participating states that had to undertake this project while also undertaking their normal day to day duties. They had to participate in training, review Terms of Reference, attend to contractors who needed all kinds of information and data, and ensure that they received most of what their countries had anticipated from the Project. Most of the countries had very limited capacities to undertake their national mandates, far less to actively participate in a 4 year project which was substantially reduced to a 36 month implementation period.

Lessons can also be learned from the project's governance structure.

Figure 19: Governance Structure of the R3i Project



Source: Report of the Project Board Meeting, 4th May 2009

While policy direction was provided by a Project Board which included a representative of the major stakeholders, including the countries, there were also 4 Technical Management Teams (TMTs) representing each of the Outputs, with Output 4 and 5 merged into a single TMT. Countries chose the TMT they wanted to participate in based on their level of expertise and the Output which was most critical to them. Thus all countries were involved in some level of decision making especially with respect to the preparation of the terms of reference.

At the completion of this project, respondents to interviews agreed that the project had achieved the following outputs that were assessed against the stated goals of the project:

- i. Increased capacity in hazard mapping and associated vulnerability assessments, to be further incorporated into spatial information systems to inform planning and development processes
- ii. A regional early warning systems (EWS) pilot for the OCTs, based on the ITU automated alert protocol for warnings
- iii. Capacity built in response, rescue and recovery, in order to shorten recovery periods through the use risk assessment and mitigation practices for development planning
- iv. Strengthened local disaster management structures and capacities in terms of tools and best practices to support comprehensive disaster risk management
- v. Greater cooperation and coordination between the OCTs, with documentation and dissemination of best practices

Box 6
Comments from the UNDP Deputy
Resident Representative

“...while sceptical at first of the slow pace, the EU has realised this project is a win-win for everyone. I believe Ambassador Diaz is very content to hear the various views of the progress to date and how it has benefitted the OCTs, and looking towards the future to build on the momentum. This project is a first for the EU and the region in working across multiple cultures and in 5 languages. UNDP’s role is one of facilitation and building partnership jointly with the OCTs. Ideally as the end of the project nears and all the bottlenecks and challenges are addressed a second phase will be developed that will address what this family of OCTs is prioritising.”

Source: Mr. Stein Hansen, Deputy Resident Representative, UNDP/Barbados and the Eastern Caribbean @ the 5th Meeting of the Project Board, In May 2012, Cayman Island

The project experienced a very slow start in 2009 while the governance and implementation issues were resolved. It began to pick up pace in 2010 when the Project Team was established in the UNDP. In 2010 the UNDP requested a one-year extension which was granted only in December 2011. The extension also allowed the UNDP to draw down on all of the contingency funds in the project. In addition the extension was a sigh of relief to some contractors who were not able to complete all their deliverables by the end of December as was stated in their individual contracts. For other contractors the extension provided the opportunity to undertake a second tranche of activities – activities that would not have been undertaken had the project closed on December 31 2011.

The project was originally conceived as a

NEX (national implementation) in that UNDP's role would have primarily been to transfer funds to national implementing agencies which, in turn, would have been responsible for their own implementation of their respective project components. At the Project Appraisal Committee meeting in September 2009, the Committee decided to utilise UNDP's DEX (direct execution) implementation modality. The DEX implementation modality was very appropriate for the R3i project because:

- i. Project activities required unique technical experience that was not readily available in the countries on in the region, in some instances'
- ii. The scope, geographical extent, and the constrained schedule needed substantive project management capacity which was not readily available in the participating states;
- iii. Strategic alliances and partnerships with other UN organisations and international networks would not have been readily accessible to individual countries; and
- iv. The geographical scope and different languages involved required a neutral agency to ensure that all countries benefitted from the project.

3.3 UNDP'S Role in Project: Implementation Organisation and Coordination

As noted above in the report, the UNDP set certain objectives that guided the organization and delivery of this project. Specifically, the UNDP tried to develop a project that was true to its philosophy of recognising the autonomy and priorities of its client groups i.e. the OCTs. There was a dichotomy between recognising the autonomy of each country and attempts to develop regional systems. The project also attempted to recognize related work that had already been done on some of the islands as well as the work done by other organizations such as CDEMA and ECHO. Finally, the UNDP developed processes and forums for the exchange of information hoping to leverage the experience of some countries to improve the results in others.

The nature of the project was that it represented a significant technological leap for some of the islands that had not considered comprehensive disaster management seriously up to the point of the project's initiation and, more importantly, a philosophical leap in the sense that the project asked for inter-island cooperation and information sharing. Finally, when a long term project involves many stakeholders, different countries with different cultures and priorities, sophisticated technological development and outside contracted services, there are bound to be issues and mistakes. Hence, the success of the planning, development and overall execution project had to be considered with the above context in mind.

Generally, both staff of national agencies and contractors were satisfied that the UNDP had developed and executed this project in a commendable manner. At the local level, the UNDP's approach of ascertaining a country's needs and tailoring the project to address them was appreciated. The project structure at both the local and regional levels with focal points worked in terms of dissemination of information and reporting back on progress within the stakeholder group involved directly with the project. The project team received special praise for their timely identification and resolution of issues as they arose.

There were issues identified to the evaluators about the organisation of the project as well.

The autonomous nature of the islands inhibited sharing of some information amongst participants. In addition there is still much scope for data sharing with other Caribbean countries that did not participate in the 3Ri Project. Consequently, the regional advantages to this project are yet to be maximised.

Outside of the stakeholders participating directly in the project, there appeared to be less connectivity and enthusiasm. Within individual islands, there were issues of obtaining information from other government departments. Initiatives that involved public outreach were frustrated by officials reluctant to test systems that might alert the public and tourists to possible dangers and inadequate response programs. Concerns were expressed that there was political reluctance to introduce policies that would interfere with development and tourism. Finally, all of these islands are facing long term dangers from climate change, but information that supports raising these issues has limited venue to be moved forward to a broader audience.

An interesting problem occurred at the outset of this project. The UNDP was admired for its attention to local needs and autonomy. However, when the contractors arrived on the islands to begin projects, they found that the needs of the islands had not been well delineated. There were two possible explanations given for this problem. First, the local staff was reluctant to expose their shortcomings to persons outside of their island when asked about their needs. Second and most probably, island staff in most of the countries did not understand what was involved in developing disaster risk reduction programs and the extent and detail of information that they had to provide. Consequently, they really could not articulate precisely what their needs were in the first place. This was further exacerbated when contractors did not agree with suggestions made by the countries or when they arrived in-country and were unaware on how to proceed.

The issue of local preparedness was further exacerbated by an issue related to appropriately scheduling project activities. Evaluators are left with the impression that more emphasis was placed on spending the budget rather than ensuring that the scope of work was aligned with the schedule. In a number of cases, projects got off to slower than expected start precisely because local staff did not accurately describe their current state of readiness. In many cases, contractors also rushed to complete the deliverables so that they could be paid although they were also aware that the projects could not be accomplished within the time frame originally allotted. This resulted in some projects being rushed to completion and some outcomes compromised. Ironically, funding eventually was extended with the result that the contractors had wasted a lot of overtime and consulting hours. It is significant that most outputs were not achieved within the original planned timeframes.

It is worthy to note that the actions undertaken under each of the outputs were very large in scope that the contractors bidding for each of these actions had to form consortia. While this helped to bring together varied technical knowledge it was also very cumbersome for the national implementing entities to manage. In some instances different members in

consortia were received differently by the staff at the national level and personality conflicts were quite the norm.

4.0 CONTRIBUTION TO RESULTS

As mentioned in a previous chapter, the R3i Project was designed as a response to:

- i. Vulnerability of the Caribbean, and specifically the OCTs, to a range of hazards
- ii. The emerging threat of climate change and variability to Caribbean SIDs
- iii. Varying levels of capacities for risk mitigation among the OCTs
- iv. The need for data and systems to support Early Recovery after a disaster
- v. Limited access to funding and resources, especially by the OCTs

In order to ensure that the response as articulated above were valid, an assessment of the capacities of each of the participating states was undertaken to gather baseline data. This was undertaken at the start of project implementation in 2010. It was also envisaged that the baseline data would be used to design of country specific activities for each of the outputs anticipated of the R3i. The assessment was undertaken using the Vulnerability Benchmarking Tool (B-Tool)⁷. The assessment focused on each of the six disaster risk management phases: risk identification (RI), risk mitigation (RM), risk transfer (RT), disaster preparedness (DP), emergency response (ER), and rehabilitation and reconstruction (RR).

Pursuant to the 2010 assessment, the R3i project was designed to deliver 5 outputs:

- i. Hazard mapping and vulnerability assessments
- ii. Early Warning Systems
- iii. Rescue, response and recovery
- iv. Technical assistance
- v. Project Coordination

Each of these outputs was, in turn, delivered through a suite of activities. A description of all the activities undertaken has been sufficiently detailed in Chapter 3. Thus the 2012 B-Tool Assessment discussed below will consider if the performance rating for each country for risk identification and disaster management has improved and whether this improvement is attributable to the project or by some other factor(s) not related to the project.

To note in the discussion of the B-Tool Assessment undertaken in 2010 and then as part of this evaluation in December 2012 are the following:

⁷ The B-Tool is an assessment tool that can be used to gather information about the state of national disaster mechanisms. It was developed by USAID and the OECS Secretariat in 2005 in response to Hurricane Ivan (September 2004) as a nationally-administered tool, designed to improve the ability of national governments, civil society organisations, and the private sector to proactively plan and implement effective and efficient actions that would reduce their vulnerability to natural disasters and create greater economic resilience when they do occur.

- The 2012 Assessment did not include Bonaire, St. Eustatius and Saba. During the course of the project, these three territories had become municipalities of the Kingdom of the Netherlands and there was much unsurity as to whether they could participate in the project.
- The B-Tool provides a snapshot of a country's exposure to natural disaster and is a tool for prioritising national and regional programmes of activities. The responses to the Tool are however based on personal perceptions in the main. There were changes in the leadership of three of the national disaster offices between the 2010 and 2012 assessments. These changes are reflected in the scoring of the B-Tool.
- A number of the persons who had participated in the initial 2010 assessment were no longer available to participate in the 2012 assessment.
- The 2010 assessment included all 6 phases in comprehensive disaster management; the 2012 evaluation included only 2 phases; i.e. risk identification and disaster preparedness. Nevertheless the comparisons were only based on risk identification and disaster preparedness.
- A two year time frame within which to conduct a second assessment using the B-Tool is too short a period to observe any meaningful changes in the status of comprehensive disaster management in a country. Disaster management is no longer the sole prerogative of disaster management offices and the actual benefits of any capacity building efforts will only be manifested during a hazard event.

4.1 Evaluation of the B- Tool Assessments

The Total Disaster Risk Management Index (TDRMI) of a country is the average of its score in each of the six components⁸ of comprehensive disaster risk management (CDRM). This is computed as: $TDRMI = \Sigma[RMI_{RI}, RMI_{RM}, RMI_{RT}, RMI_{DP}, RMI_{ER}, RMI_{RR}] \div 6$

Calculating the Risk Management Index (RMI) for each component of comprehensive disaster risk management uses the following formula, where TS is the total score obtained in the section and MAS is the maximum attainable score: $RMI_i = TS_i / MAS_i$

Score	Performance rating
80% and above	Excellent
65% - 79%	Very good
50% - 64%	Good
35% - 49%	Average
Less than 35%	Below average

The meaning of these scores in relation to the effectiveness of national capacities is evaluated in relation to the performance scale reproduced in Table 2.

Table 2: Performance rating scale for the B-Tool

While the purpose of the Assessment undertaken in 2010 was to establish a baseline of a country's status in comprehensive disaster management, the purpose of the second

⁸ These include risk identification, risk management, risk transfer, disaster preparedness, emergency response, and rehabilitation and reconstruction.

assessment was to ascertain whether changes had occurred to each participating country's risk identification and disaster preparedness indices⁹ as a result of project activities. This second assessment is part of the project evaluation and details of the country assessments and a regional synthesis is provided as Appendix 7.

4.1.1 Comparison of the 2010 and 2012 Assessments

Table 3: 2010 Performance Rating.

Country	RMI _{RI}	RMI _{DP}	TDRMI %	Performance Rating
Anguilla	42	74	58	Good
Aruba	61	57	59	Good
Bonaire	52	47	50	Good
Cayman Islands	43	63	53	Good
Curaçao	77	60	69	Very Good
Montserrat	80	67	74	Very Good
Saba	17	47	32	Below Average
Sint Eustatius	22	56	39	Average
Sint Maarten	34	57	46	Average
Turks and Caicos Islands	45	58	52	Good
Virgin Islands	73	82	78	Very good
Average Score	50	61	55	Good

Source: Adapted from Evaluation Summary, 2010

Table 4: 2012 Performance Rating

Country	RMI _{RI}	RMI _{DP}	TDRMI %	Performance Rating
Anguilla	48	61	55	Good
Aruba	81	63	72	Very Good
Bonaire	-	-	-	-
Cayman Islands	66	90	78	Very Good
Curaçao	40	57	49	Average
Montserrat	61	75	68	Very Good
Saba	-	-	-	-
Sint Eustatius	-	-	-	-

⁹ Using these risk management indices (RMI), the country is able to identify the adequacy of its risk management initiatives, identify gaps, overlaps, omissions, as well as strengths and successes. The indices may be used to select and prioritise projects and programmes that will help to improve its future rankings.

Sint Maarten	56	60	58	Good
Turks and Caicos Islands	27	41	34	Below average
Virgin Islands	94	87	91	Excellent
Average Score	56	64	63	Good

Table 5: Comparison of the Risk Management Index and the Disaster Preparedness Index for 2010 and 2012

Country	RMI _{RI} 2010	RMI _{RI} 2012	Variance in RMI _{RI}	RMI _{DP} 2010	RMI _{DP} 2012	Variance in RMI _{DP}
Anguilla	42	48	6↑	74	61	13↓
Aruba	61	81	20↑	57	63	6↑
Bonaire	52	-		47	-	-
Cayman Islands	43	66	17↓	63	90	17↑
Curaçao	77	40	37↓	60	57	3↓
Montserrat	80	61	29↓	67	75	8↑
Saba	17	-		47	-	-
Sint Eustatius	22	-		56	-	-
Sint Maarten	34	56	22↑	57	60	3↑
Turks and Caicos Islands	45	27	18↓	58	34	14↓
Virgin Islands	73	94	20↑	82	91	9↑
Average Score	50	56	4↑	61	64	4↑

Table 6: Comparison of the TDRMI and Performance Ratings

Country	TDRMI % 2010	TDRMI % 2012	Variance in TDRMI % points	Performance Rating 2010	Performance Rating 2012
Anguilla	58	55	3↓	Good	Good
Aruba	59	68	9↑	Good	Very Good
Bonaire	50	-		Good	-
Cayman Islands	53	71	18↑	Good	Very Good
Curaçao	69	47	22↓	Very Good	Average
Montserrat	74	65	9↓	Very Good	Very Good
Saba	32	-		Below Average	-
Sint Eustatius	39	-		Average	-
Sint Maarten	46	50	4↑	Average	Good

Country	TDRMI % 2010	TDRMI % 2012	Variance in TDRMI % points	Performance Rating 2010	Performance Rating 2012
Turks and Caicos Islands	52	34	12↓	Good	Below average
Virgin Islands	78	92	14↑	Very good	Excellent
Average Score	55	60	5↑	Good	Good

Referring to tables 3 to 6 above:

- The overall Risk Management Index (**RMI_{RI}**) had gone up by 4 percentage points. The project had anticipated an increase of 15% percentage points.
- The overall Disaster Preparedness Index (**RMI_{DP}**) had also gone up by 4 percentage points. The project had anticipated an increase of 15%.
- The overall Total Disaster Risk Management Index (**TDRMI**) rating had increased by 4 percentage points as compared to the 10% that had been anticipated.
- There were more significant variances within countries and between the countries, for both years, for both the indices.
- The overall performance rating for both years has remained consistent at “good”.

As already noted above, the results of a comparison of the 2010 and 2012 assessments have to be treated guardedly. For one, 2 years is a very short time period for deliverables of the nature produced by the project to become effective at the national level. More importantly, even while the 2012 assessment was being undertaken project activities were still being implemented – in the Cayman Islands a response to the social assessment was still under review and in the TCI a major workshop to present outputs was planned for the 18th December 2012; the countries that participated in the multi-country alert system had just received their equipment and were installing and testing the equipment; the BVI had just received its storm surge and tsunami models, the quality of which were in dispute; and so on.

Secondly, the 2012 assessment was not subject to the rigour that the 2010 assessment had been subject to. The field visits to each country did not only include a B-Tool assessment but also included a detailed evaluation of the project outputs, with the emphasis being on the latter. There were also fewer people involved in the B-Tool Assessment in each country in 2012, as compared to the interdisciplinary teams that participated in focussed group discussions and assessment in 2010.

Thirdly, in many countries, the persons who participated in the 2010 assessment were not available to participate in the 2012 assessment; in some instances only one or two persons from the 2010 assessment were available in 2012.

It may have been too ambitious of the project to anticipate the 15% increase in the Risk Identification and Disaster Management indices respectively, more so since this anticipated increase was not based on any assessment of the extent to which countries had internally absorbed and were effectively using the products delivered by the project.

Lastly, the changes that have occurred between the two years may not be a result of the project. The significant changes in the VI were a result of national budgetary allocations into those weak areas that had been identified in the 2010 assessment. By similar token, the decline in the indices in some of the countries can probably be attributable to factors beyond the control of the project.

4.2 Evaluation of Outputs

The object of the discussion over the next few pages is an evaluation of whether the 5 outputs have been met. The following indicators were provided in the Terms of Reference. There was no mention of Output 4 in the Terms of Reference. This Output pertained to the conduct of the B-Tool Assessment in 2010 and the role of the Technical Quality Specialists. Since no indicators were identified for Output 4, this Output is not evaluated in this section.

Output 1:

- Number of national GIS databases updated with geospatial datasets and vulnerability information
- Number of national personnel trained to collect and manage geospatial data

Output 2:

- Number of countries with operational EWS pilots

Output 3:

- Number of training activities completed to improve local capacities
- Number of national policies formulated or revised

Output 5:

- Number of new joint activities executed based on common priorities

Table 7: Evaluation of Project Output Indicators

Outputs	Number of deliverables
Output 1	<p>This has been completed for all the countries. More than 100 persons have been trained in the collection and management of geospatial data: <u>Regional Training</u></p> <ul style="list-style-type: none"> • Introduction to GIS (20 trainees) • Field data collection (22 trainees) • Editing and managing spatial data (22 trainees) <p><u>National Training</u> More than 50 persons have been trained in Sint Maarten, Anguilla and Cayman islands.</p>
Output2	<p>EWS have been established as follows:</p> <ul style="list-style-type: none"> - Anguilla – tsunami, cable interrupt - Aruba – notification of emergency responders - Montserrat – volcano, sirens - Sint Maarten – flood, sirens <p>The systems have only recently been installed and it is too early to determine</p>

	<p>whether they are fully operational. In addition some of the countries have had issues with the contractor responsible for this output.</p> <p>The multi country interoperable system installed in the 4 pilot countries is very innovative and the extent to which this system will be fully functional can only be determined in the event of a hazard. In addition, all the countries participating in this multi-country system must ensure that each of their individual components is operable and remains operable even after the 3 year warranty period financed by the project.</p> <p>Anguilla's EWS is now at a level three and has enabled the country to earn the status of a "Tsunami Safe Community"</p> <p>Emergency Managers' Weather Information Network (EWMIN) systems were provided to all OCTs and training on installation and operation was provided in cooperation with UCAR JOSS. All countries appreciate that they now have a fully operational EWMIN)</p>
Output 3	<p>Training, certification and the provision of light equipment was provided under the SAR sub-component.</p> <p>National level training was also provided in hazard-resilient construction, oil spill and hazardous materials management, recovery planning, relief distribution and shelter management, EOC management, business continuity management (BCM), damage and needs assessment, debris management.</p>
Output 5	<p>6 regional workshops were held.</p> <p>Policies were revised in 4 countries.</p> <p>There are 2 new joint initiatives:</p> <ul style="list-style-type: none"> • Implementation of the Common Alerting Protocol (CAP) for EWS • Adoption of INSARAG guidelines for search and rescue operations <p>There is much scope for transferring the bathymetric data collection undertaken in Sint Maarten, paving the way forward for affordable bathymetric surveys in the Caribbean. This will indeed allow for more cost-effective and widespread coastal hazard modelling to inform development planning and resilience retrofitting in the region.</p> <p>In addition to these initiatives, mention must also be made of the increased cooperation between the participating states. BVI provided 6 trainers in search and rescue; Anguilla provided a technician to assist with setting up the equipment for EWS in the 3 other pilot countries, etc.</p>

Output 1: Hazard Mapping and Vulnerability Assessments

Substantial training has been provided in hazard mapping and vulnerability analysis. In all instances countries have acknowledged that they will continue to undertake in-house training in order to ensure that the national disaster offices always have the necessary trained capacities. They do also however acknowledge that the number of personnel that is assigned to disaster management is a national prerogative and very much a function of the national budget.

Those other agencies that have received training in vulnerability assessment and hazard mapping have already started using the deliverables in the executing on their development

planning duties. Anguilla, for instance has now been able to integrate the geospatial data acquired through the project into a new GIS database and projection. Anguilla, also now has national capacity for GIS and Remote Sensing for Infrastructure Management and Disaster Risk Reduction.

It is, however, too soon to evaluate the extent to which the persons trained by the project will continue to remain in their respective posts and are provided the necessary structure and enabling environment to continue to use the skills that they had acquired through the project.

Close to 50% of the project funds were channelled to activities in output 1. In addition to the training that was provided to different agencies at both the regional and national levels, each country received equipment to assist with the vulnerability analysis and hazard mapping; some also received new geospatial data.

During the 2010 B-tool Assessment Anguilla requested specific datasets and hazard maps e.g. flood maps, contour maps to better facilitate the work of the Department of Disaster Management. Anguilla now has new geo referenced maps; BVI has storm surge and tsunami models, land slide and slope cut maps; and Sint Maarten has inland and coastal flooding and tsunami models and maps.

The staff of the Crisis Management Centre in Aruba was very insistent that Output 1 had greatly improved their capacity in GIS. The Centre had hazard mapping and GIS slated for future programmes and the project facilitated this process quite well. The training and equipment were appropriate and met the needs of Aruba.

The Turks and Caicos Islands felt that the training was not sufficiently comprehensive. Nevertheless, they noted that they made significant strides through output 1, especially in the development of geodata sets; the number of agencies trained in GIS, and the national awareness and acceptance of the need for geodata in DM as manifested in the establishment of a national Task Force to advance Geodata development; and use of geodata sets in decision making and forecasting

GIS capacities and capabilities are well developed in the Virgin Islands. There is a national GIS Grid and the planning and disaster management departments work collaboratively in hazard analysis and hazard mapping. Unlike most other national disaster offices in the Caribbean, especially the smaller islands, the GIS capabilities in the VI's Disaster Management Department are well developed. Nevertheless, the storm surge and tsunami modelling provided through output 1 required a certain level of technical knowledge, while the meta data and models were being generated, that the Department had to depend on technical backstopping from the Quality Control expert provided by the project. Nevertheless now that the models have been completed the VI has developed the maps and which will be used for planning and development control purposes.

The Cayman Islands (CI) have made several strides to achieve comprehensive disaster management (CDM) since the island was impacted by Hurricane Ivan in 2004. An Atlas of

20 possible storm tracks under 125 and 150 mph winds show possible impacts of storm surge (including wave heights) on the CI. These products were built upon under R3I - Critical Infrastructure mapping, Environmental resources (enhanced); Loss Estimation and risk assessment and social assessment undertaken to advance CDM. The Caymanians who were interviewed during the interview felt that the deliverables that they received through Output 1 were in line with their country's development priorities and national needs.

Curaçao felt that it should have gained more from Output 1: Their hazard mapping has not been completed and felt that the process took a long time. Among Curaçao's challenges with output 1 were the time taken to assemble all the data that was required by the contractors for the output.

Sint Maarten was very appreciative of how output 1 was rolled out in that country. The island's human and technological GIS capacity was very limited and previously maps were developed on a needs basis. Through R3i, Sint Maarten was able to receive inland and coastal flood models and maps, and also bathymetric data that it did not have previously.

Output 2: Early Warning System (EWS)

Like output 1, this output too was a significant component of R3i. A multi-island all hazard-alerting system that was designed through in-country consultations has been established through the project. This system is based on the international Common Alerting Protocol standard and builds on Anguilla's experience with the system since 2007. While it is still too early to evaluate the effectiveness and efficiency of this multi-island system, it is the first of its kind in the entire region.

Significant training was also provided through output 2, especially with reference to the common alerting protocols. Anguilla, however, felt that the training was too short (4 hours) and rather rudimentary.

The Anguilla Department of Disaster Management has an existing Warning System which required modifications to the BamBox software configurations to continue its operations providing community warning services. The R3i provided this software adaptation. Although Anguilla is concerned over the reliability of the software, testing is ongoing.

Due to lack of radar facilities in some islands and location of meteorological services off-island, weather forecasts received can be generalised in nature. TCI for instance depends on The Bahamas Meteorological Services for information about hurricanes. Thus, during the 2010 B-Tool Assessment a number of countries indicated that a locally-based EMWIN system could reliably provide early warning information in real time that is actionable. The R3i has established Emergency Managers' Weather Information Network (EWMIN) systems in all the countries and personnel have been trained in the use and maintenance of these systems.

Through this output countries also have received a model policy for EWS, and various protocols, templates of alerting messages, and multi-lingual (5 languages) public outreach and educational material. All of these products can be readily adapted to the other Caribbean countries.

Through Output 2, the R3i aimed to improve the Anguilla Warning System and have a Warning System capable of warning the entire population. This is one of the principal requirements of the TsunamiReady distinction.

Output 3: Response, Rescue and Recovery

The 2010 B-Tool Assessment Report states that generally all the OCTs were satisfied with their emergency response and humanitarian assistance capacity, although specific training in urban search and rescue was identified as a need. In response, the R3i developed and implemented a multi island plan for Response, Rescue and Recovery.

Some countries were provided with training and certification in search and rescue. They were, each, also provided with a set of equipment for light search and rescue.

Cayman Islands received Urban Search and Rescue training for 11 first responders especially in urban areas –training along with equipment (ropes etc), backpacks for specific disasters. The country also received training in contingency planning and shelter management. Training was also provided in the Turks and Caicos Islands.

Curaçao also received training and light equipment in Urban Search and Rescue. There was however a feeling that the training would have been more beneficial if it had been conducted in Dutch and if the training material had been translated into the Dutch language. Nevertheless, Curaçao is very satisfied with the training provided through Output 3. The persons interviewed during the project evaluation were very satisfied with the contractors for Output 3 and felt that the training resolved a critical gap in RRR in that country.

Similar training was also completed in Aruba and Turks and Caicos. Staff trained has reported that they have actually been able to take advantage of the training and equipment received in the form of search and rescue operations conducted in two separate instances.

In addition to the training, some countries were also provided with emergency telecommunications equipment. The project purchased necessary equipment to upgrade the telecommunications infrastructure for Montserrat and to a lesser extent for Aruba, Curaçao and Anguilla.

Five operators from Montserrat received training on technical operations and maintenance of telecommunications equipment in Grenada.

On line Business Continuity Training was provided through the Lavity Stouff Community College in the BVI. Fifty-four trainees registered for the course; 48 participated

effectively; and 38 completed the course. Thirty one of the trainees obtained certification as a Continuity Manager.

The Project also offered courses in oil spill management to Aruba, Sint Maarten, Anguilla, TCI and Saba. The project was able to source REMPEITC, a UN Agency based in Curaçao to provide the training. This activity was also used to update the countries' National Spill Contingency Plan. In addition, 25 senior managers and first responders received introductory training on Oil Pollution Preparedness, Response and Cooperation.

Immediately following the completion of the field work for this evaluation, REMPEITC also undertook training in Saba financed jointly by the Government of the Netherlands and R3i. The project financed participants from 4 other countries to this training, which involved deployment of an Oil Spill Boomer.

During evaluation interviews, the Head of Disaster Management stated that the training provided through Output 3 has impacted different sectors in Montserrat – emergency Telecom for different agencies (Airport and Police), and BCM training (Government Information Services, Police and DMCA. In general, all the countries that participated in Output 3 as pilot countries were very appreciative of the deliverables in this output.

Output 5

Among other things involved in project coordination and management, this output was the project's focus on cooperation and the sharing of best practices and lessons learned. The cooperation established through this project has already been described in Chapter 3; it will therefore suffice to briefly mention some of these arrangements which also provide tremendous opportunity for scaling up some components of this project to the wider Caribbean.

- i. The multi island, all hazard alerting systems which is based on the common Alerting Protocol. This initiative is the first of its kind in the Caribbean and can prove to be a valuable lesson for integrated EWS in the Caribbean.
- ii. The landslide maps and cut slope data that had been produced for the Virgin islands is an intervention that has been requested by a number of the other participating countries. While it may not be delivered through this project, a number of them stated that they will use national resources to develop the maps and to implement the techniques for cut slope.
- iii. A similar initiative that has potential for scaling up and replication throughout the Caribbean is the combined Jet Ski/satellite technology for collecting bathymetric data that was done under Output 1 in Sint Maarten.
- iv. It will be remiss of this evaluation if it does not highlight the technical assistance that the Virgin Island and Anguilla provided to the other participating countries in EWS and SAR. Technical Expertise from the Cayman Island DDM was critical to developing a functional solution to Montserrat's Emergency Telecoms challenges when commercial vendors did not offer relevant options. Such south-south technical

cooperation lends itself to further regional cooperation and for valuing local expertise that is often overlooked in favour of extra-regional expertise.

- v. It is also important to recognise that the Project brought together the Dutch speaking and the English Speaking OCTs in a single regional project. That also is a difficult task and the UNDP is to be commended for taking on the challenge especially since the project management team in UNDP was very small. This team did not only have to work with 10 countries spanning two languages but also with a battery of contractors many of whom had to themselves work under serious time constraints and with a multitude of personalities in each country and between countries.

The number of outputs that have been delivered by this Project is significant. It is estimated that at least 95% of the stated outputs were delivered. The remaining 5% covers those outputs that were delivered after the evaluation and those outputs that countries had anticipated but did not receive for one reason or another. Very importantly, these outputs helped to close a number of the gaps that countries had identified during the 2010 B-Tool Assessment.

The results of the 2012 B-Tool assessment may be below the expected targets and complaints may have been expressed during the evaluation consultation, but the fact remains that this 4 year project – which effectively was only a 3 year implementation period – undertook to assist 10 OCTs which previously did not, in the main, participate in regional projects. The assistance was not only through regional training and other “regionalised” activities like developing model policies and legislation, but which responded directly to national needs and priorities. In many instances the deliverables that countries received through each of the outputs would not have materialised had it not been for R3i. The challenge in the next few pages then is to evaluate the project to test it for relevance, efficiency, effectiveness, and sustainability.

As already described under the section on Methodology in Chapter 2, 4 members of the evaluation team were deployed to 8 countries. Saba, St. Eustatius, Turks and Caicos were not included in the field visits. A telephone interview was conducted with personnel in Turks and Caicos. The fifth team member conducted telephone interviews with the contractors and Technical Quality Assessors who were involved in the project. This team member also participated in the R3i meeting in Jamaica.

The interviews were based on an interview protocol which was field tested in the BVI and then refined for use in the other consultations.

4.3 General Project Evaluation

The evaluation in this section will contribute to an assessment of:

- i. The relevance of the project;
- ii. The effectiveness and efficiency with which EU resources were used;
- iii. The usefulness and sustainability of the project to the beneficiaries;
- iv. UNDP’s performance as a development partner; and
- v. UNDP’s contribution to the expected result.

RELEVANCE

1. The Project was very relevant to the needs and priorities of each of the participating countries although they were at different levels of disaster management and different levels of capacities.

Relevance

- Concerns the extent to which a development initiative and its intended outputs or outcomes are consistent with national and local policies and priorities and the needs of intended beneficiaries. Relevance also considers the extent to which the
- Concerns the congruency between the perception of what is needed as envisioned by the initiative planners and the reality
- of what is needed from the perspective of intended beneficiaries.
- Incorporates the concept of responsiveness—that is, the extent to which UNDP was able to respond to changing and emerging development priorities and needs in a responsive manner.
- An essential sub-category of relevance is the criteria of appropriateness, which concerns the cultural acceptance as well as feasibility of the activities or method of delivery of a development initiative.

Source: *UNDP HANDBOOK ON PLANNING, MONITORING AND EVALUATING FOR DEVELOPMENT RESULTS*

The project was initially designed by a few of the English speaking OCTS. Anguilla had been developing its capacities in early warning systems and wanted additional actions to strengthen this capacity. The Virgin Islands had very well developed capacities for GIS in the Disaster Management Department and was an integral member of the National GIS Committee. In 2008 the BVI decided that it needed to extend its hazard mapping and vulnerability assessment to storm surge and tsunami modelling. Anguilla on the other hand had outdated maps and needed to undertake a LiDAR aerial survey for the entire island. Thus from the onset some of the countries had already identified their needs and priorities. Additionally, the Project was also designed to build and expand on existing capacities in for example GIS, EWS and Search and Rescue.

In 2010, just prior to the start of project implementation consultations with the disaster managers allowed preliminary identification of initiatives and country needs. Additionally the conduct of the B-Tool Assessment assisted in identifying the capacity gaps for each of the countries for the 6 phases in comprehensive disaster management.

The responses that were received during the evaluation exercise also indicated that the participating countries felt that the project was indeed very relevant to their needs. Anguilla, for instance, stated that the project outputs were consistent with the country's emerging development issues as was articulated in Anguilla's Medium Term Economic Strategy (MTES) for 2010-2014, specifically with reference to, "provide social development support and protection, as well as reduce environmental vulnerability". Similarly the staff at the Crisis Management Centre in Aruba stated

emphatically that the project was very relevant to the country's priorities and needs. The staff actually likened the project to a cornerstone that formed a foundation for their Disaster Management programme to build upon.

In the case of the BVI, the island had been subject to many hazard events which has been a burden to its national budget. The most significant hazard impact in BVI was from inland flooding and landslides – 2003, 3006 and 2010 resulting in the Government accessing a 15.9 million US\$ loan from CDB in 2012. Thus the storm surge and tsunami modelling and the landslide maps and cut slope technique generated through output 1 of the project was significant for the country, even though the quality of the models are in dispute.

Curaçao was satisfied that the Project had brought about positive changes in the Disaster Management programme of the country: It made the country realize that a full time disaster management office and staff is critical in order to do a good job. In addition, the interviewees felt that the outputs met the country objectives in particular the hazard mapping and the GIS systems that were acquired.

Montserrat is one of the countries which conceptualised the project based on needs that were assessed in initial discussions. The project is aligned with Objective 6 of the Country's Strategic Plan, i.e. "To ensure that Montserrat's development is environmentally sustainable and includes appropriate strategies for disaster mitigation".

Hurricanes have been identified as being the most significant to impact Sint Maarten within the past 50 years. In addition, flash flooding, inland flooding and storm surge also pose significant problems for country planning. Sint Maarten too therefore noted the relevance of the project to the country's priorities and needs as it seeks to address natural risk and exposure.

The contractors who were interviewed during this evaluation also agreed that the UNDP's process involved the countries up front in determining their needs and priorities. The one issue was that some of the countries, because of inadequate capacities, could not fully articulate their priorities at the outset of the project.

Finally, one of the unstated benefits to the project is that a generation of islanders in the OCTs have been educated in the identification of potential hazards and (i) the process of mitigation through vulnerability assessments and hazard mapping, and (ii) the process of remediation through EWS and response, rescue and recovery.

2. The Project Outputs and activities were consistent with the recommendations from the 2010 B-Tool Assessment

The outputs through which the project was delivered were not arbitrarily chosen by the UNDP or the European Commission. These outputs and the activities contained under each one of them were first in response to the challenges identified by the countries that had conceptualised the project in 2008; and then to the recommendations identified in the 2010 B-Tool Assessment. Of the 9 recommendations provided in the Assessment Report, 6 were implemented. These included:

1. Loss of communication during disasters is an area of concern, and relevant backup systems are needed, especially in multi-island jurisdictions. (OUTPUT 2)

2. Effective early warning and communication systems need to be established that will inform the population (local and tourist) about what to do in each event. (OUTPUT 2)
3. Data storage and backup systems needs to be addressed, particularly within continuity plans to ensure that important information including critical datasets and official documents are not lost. (OUTPUT 3)
4. Application of GIS tools can be more comprehensively integrated into the land use planning and disaster mitigation culture to help reduce the negative impacts of disasters. (OUTPUT 1)
5. Drills and exercises that address locals and tourist populations alike should be executed with greater frequency, particularly multi-hazard evacuation drills in particularly vulnerable areas. (OUTPUT 3)
6. Effective cradle to grave chemicals/hazardous materials management programmes should be put in place, especially for vulnerable communities that reside within the vicinity of oil refineries and other chemical industrial plants. (OUTPUT 3)

The remaining 3 recommendations¹⁰ were of a nature that could be undertaken by the countries themselves after their capacities had been improved by the project.

EFFECIENCY

1. Delivery rate

The R3i Project was designed to cover the 6 Dutch OCTs and 5 UK OCTs in the Caribbean: Anguilla, Aruba, Bonaire, Cayman Islands, Curaçao, Montserrat, Saba, Sint Eustatius, Sint Maarten, Turks and Caicos Islands, and Virgin Islands.

These territories are spread throughout the Caribbean Sea with 3 (Aruba, Bonaire and Curaçao) being on the western side close to the South America and forming the southern most arc of the Lesser Antilles, while 2 of them (Cayman islands and Turks Caicos Islands) belong to the Greater Antilles and are on either side of Cuba to the north. The remaining OCTs (VI, Anguilla, Sint Maarten, Saba, Sint Eustatius and Montserrat) form the northern arc of the Lesser Antilles on the eastern most side of the Caribbean Sea. This shows the geographical extent which the project covered, notwithstanding that it also covered two languages. Please refer to Figure 1 on page 2.

Efficiency

- Measures how economically resources or inputs (such as funds, expertise and time) are converted to results.
- May involve estimates of the total UNDP investment (all projects and soft assistance) toward a given development outcome.
- Some analysis of delivery rates, the reasons some initiatives are implemented more quickly than others, and overall management ratios at the programme level might be considered.
- Assessment of how the partnership strategy has influenced the efficiency of UNDP initiatives through cost-sharing measures and complementary activities.

*Source: UNDP HANDBOOK ON
PLANNING, MONITORING AND
EVALUATING FOR DEVELOPMENT*

¹⁰ (1) Increased signage should be placed on evacuation routes, especially considering those persons unfamiliar with the territory; (2) Drills and exercises that address locals and tourist populations alike should be executed with greater frequency, particularly multi-hazard evacuation drills in particularly vulnerable areas; and (3) Partnerships between the disaster offices and the insurance industry need to be developed to facilitate adherence to building codes and other mitigation measures in the absence of legislation and regulations.

In order to ensure relevance of the project to each of the participating states the project was designed with a high degree of flexibility. Every attempt was also made for each country to benefit from each of the 3 technical outputs and to participate actively in the other 2 outputs. This may have been too much to assimilate especially for those countries where the capacities for disaster management, in general, had been determined to be low. Sint Maarten felt that, “there was a tendency to inundate Focal points with requests, etc”. Turks and Caicos Islands and Aruba noted that most of the work was actually undertaken in the last few months of the project life, after an extension had been granted to the project. This in turn placed undue pressure on the project’s country focal points and on the countries in general. Countries had to deal with multiple contractors very often all at the same time; they also had to provide the same data multiple times. Curacao also felt that there were far too many contractors and there was inadequate coordination of these contractors.

With so many individuals involved in project implementation – countries, UNDP, contractors, technical Quality Assessors – personality conflicts were not unknown. Some countries did not feel comfortable with the contractors; there were also instances where contractors themselves did not feel comfortable with the countries.

The short time frame within which to complete project activities and the delay in project extension also impacted on the number and quality of deliverables that each country was to receive.

The VI for instance, received its storm surge and tsunami models about 4 weeks before the project was to close. A number of deficiencies were identified in the deliverables and at the time of evaluation the VI still remains adamant that the quality of the deliverables has been compromised. There is also some debate about the types of models used. Furthermore, while the contractor was to have delivered maps and undertaken a last round of consultations to validate the maps and to provide training in the use of the models, this phase had to be cancelled because there was no time or funds left on the project schedule and budget.

Nevertheless, it is also noted that project activities in the BVI for this output included the collection of bathymetric and topographic data, the former of which took a rather long time and with a resultant disagreement between UNDP and the BVI over the methodology that was used to collect the data. The BVI may have underestimated the length, complexity and cost of a tsunami modelling and storm surge modelling process. Given the time frame of the project, more efforts should probably have been placed in obtaining a higher resolution data rather than progressing to the phase of modelling. Having said that, the evaluation is also cognizant that funding at the national level for modelling and such scientific work is usually very limited and it is not surprising that the Department of Disaster Management in the BVI had seen the R3i and the opportunity to obtain such models and maps.

The BVI had also requested telecommunications equipment under output 3. It did not receive this equipment and is understandably upset¹¹. Similarly Sint Maarten had hoped to but did not receive rain gauges, water level meters and the cell broadcast implementation plan Cayman Island had wanted training and equipment in EWS but was not able to receive these. Montserrat expressed a sense of loss regarding quota/allocations as adjustments were continually being made. Montserrat did, however, acknowledge that the outputs were generally delivered within the overall cost estimates.

Given the sheer scope of project deliverables, especially Outputs 1 and 2, and the fact that these deliverables had to be completed by the end of 2011, in the first instance, many contractors were forced to put in additional and unbudgeted professional hours and other resources which could have impacted on the quality of the deliverables. Another issue with the contractors was that, although they had technical expertise, they had weaker project management skills and some had limited experience in the Caribbean.

2. Country expectations V outputs delivered

It is not surprising that countries had very high expectations of the project. This was the first time that they were participating in a project that had been designed and financed to specifically meet their own needs rather than participating in a wider Caribbean project which included the independent countries. It is also now apparent that countries were unaware of how complex the project was in terms of the technical nature of some of the planned activities; the complexity of international procurement; and the time taken to deliver on these technical actions.

While the implementation mode was to ensure that there was some modicum of equity of resources between the countries, the evaluators note that:

- i. Those countries that had the necessary capacities to articulate their needs in a succinct manner and who were already advanced in many aspects of disaster management benefitted more from the allocation of the Project's financial resources. (The BVI, Anguilla, Montserrat, Cayman Islands, and Sint Maarten being cases in point.
- ii. The cost of Outputs 1 and 2 doubled; this was, however, at the expense of some of the national training and equipment.
- iii. The very small project management team in UNDP could not, from time to time, service all the requirements from each of the countries.

Nevertheless as has already been presented in Chapter 3, all countries benefitted from the project.

¹¹ Nevertheless USD 300,000 worth of telecom equipment were delivered to Montserrat, Aruba, Curaçao and Anguilla.

As was identified in the 2010 B-Tool Assessment, many of the countries had very limited capacity for comprehensive disaster management which in turn could have affected their own perceptions and ability to articulate what they wanted out of the project. Contractors have reported not being able to receive information on a timely basis; data was stored in different formats and had to be manually manipulated to ensure similarity in format; and capacities were not of a level to receive the standardised training and the methodologies that had been requested in the terms of reference.

3. Resource use

The budget for Output 1 was more than doubled during the life of the project. This was a result of data collection in order to develop HM and VA, and provision of requisite training, equipment and software to build local capacities. Further, the acquisition of some detailed datasets to be able to develop hazard models (Sint Maarten, BVI, and Anguilla) was one of the most costly components.

The budget for Output 2 was also doubled. Designing the activity was cost effectively completed through the mutual support of the OCTs sharing national capacities, as well as through technical expertise retained by the project for quality assurance. The budget increased with the decision to include 4 “pilot” OCTs, so as to pioneer the Caribbean’s first multi-country integrated warning system within the Common Alerting Protocol (CAP) system. Equipment to complete the pilots constituted the increase to the original budget.

It is too early to evaluate this multi-country EWS but the comments from the technical expert who was contracted to advice on Output 2 suggest that the project should not have attempted the multi-country system because of the differences in capacities and potential threats between the countries. It was, nevertheless, pointed out that even without the multi-country system the project has achieved significant results. Anguilla’s EWS which was already fairly sophisticated was upgraded to a level 3; Montserrat was able to service and replace equipment that had not been maintained for years; Aruba, which did not want to raise public fears about potential risks, received a first responders’ notification system; and Sint Maarten received a CAP-server and capacity to send alerts through email, radio interruption and sirens (CAP automated).

Finally, despite the large number of multi lingual public outreach and educational material that was developed under Output 2, there is still insufficient understanding of EWS and CAP among the general population and the public sector agencies; and the major economic sectors in these countries.

4. Delivery of outputs

As previously mentioned the rate of delivery of project outputs is estimated at 95%. Nevertheless it would be remiss of the evaluators if no mention is made of some of the concerns expressed by the countries about the of delivery of the outputs. The complexity of the project coupled with the wide geographical and cultural scope of the project has resulted, at least up to the time of undertaking this evaluation, in a number of countries not receiving all the deliverables. In other instances countries reported that the deliverables were cancelled.

Anguilla reported that their EWS is not effective because the server is not operational and the vendor should have resolved the problem within the time frame established in the maintenance agreement. According to the Project Team at UNDP the system should be back up in January.

To the VI, their tsunami and storm surge models and maps were delayed because there were many issues with the contractor, the primary ones being lack of communication between the contractor and the VI. The VI also opined that the untimely delivery of their outputs has impacted on the quality and quantity of the products anticipated by VI. It was also noted that that there were significant delays in the procurement process. The TORS for the bathymetric survey had to be advertised twice and one of the contractors was not readily accessible because of other commitments. The project and the VI may have underestimated the length, complexity and cost of a tsunami and storm surge modelling process.

Cayman islands informed the evaluators that the social assessment has not been integrated into the hazard maps; the impacts of the tourisms sector which is crucial to the economy of the Cayman Islands were not included in the Loss Estimation Exercise; seismic loss was not included in the Loss estimation; and the EWS for tsunamis and earthquakes was removed from deliverables that they had anticipated.

Most of the deliverables have been delivered to Sint Maarten although they had anticipated receiving additional products in landslide maps and cut slope techniques; storm surge & tsunami modelling.

There appears to be misunderstanding between some of the countries and the Project Team in UNDP. The Cayman Islands for instance informed the evaluators that they had expected the project to provide them with EWS for tsunamis and earthquakes; the BVI had anticipated receiving telecommunications equipment; and St. Maarten had anticipated receiving rain gauges and water level meters. The UNDP, however, maintains that these anticipated deliverables were not part of the original project design.

The contractors and technical quality assessors who were interviewed also noted that while most outputs had been delivered, there were still some that were missing. In

addition they felt that while the outputs will contribute to comprehensive disaster management in these countries, missing are legislation, protocols, procedures, and imbedded long term funding¹². Nevertheless of importance to note is that adjustments to project deliverables were made only after consultations with the appropriate TMTs and the Project Board.

Despite some angst on the part of a few countries, a number of other countries were satisfied that they had received all the deliverables that they had anticipated. Aruba, and Curaçao for instance were very satisfied that they had received more than what they had requested. Most of the items were delivered on time; those not delivered on time were late due to logistical issues especially shipping or items were delivered to incorrect locations. However in all of this they were still, over all, satisfied with the project. Montserrat too was satisfied that they had received all their deliverables except the telecommunications equipment and training which is on schedule for delivery at the end of December 2012 and January 2013 respectively.

Effectiveness

- a measure of the extent to which the initiative's intended results
- (outputs or outcomes) have been achieved or the extent to which progress toward outputs or outcomes has been achieved.
- Attributing observed changes or progress toward changes to the initiative (project evaluation) or determining UNDP contributions toward observed changes
- Judging the value of the change (positive or negative)

Source: UNDP HANDBOOK ON PLANNING, MONITORING AND EVALUATING FOR DEVELOPMENT

EFFECTIVENESS

1. Role of the UNDP Project Team

The vast majority of the countries had high praises for the project team, especially the Project Coordinator who they felt went out of his way to ensure that their needs were always attended to and that problems with contractors were resolved quickly and amicably. Some wondered if the Project Coordinator should have been from the region. The evaluation, however, contends that this comment was made more in terms of a sense of nationalism rather than the efficiency and effectiveness of a Coordinator who was from outside of the region.

A couple of the countries felt that the project team sometimes did not undertake timely activities which at times resulted in the activity having to be cancelled. This is probably a result of the Project team having to manage so many activities and so many contractors all at the same time.

¹² The three latter points do not seem to be part of the actual project plan although they are referenced as a goal.

As in any project that involves so many different personalities operating at so many different levels, there were, from time to time, personality conflicts between the project management team and the beneficiaries. These conflicts were few and far in between to have materially affected project implementation and delivery.

2. Procurement Procedures

A general feeling that was expressed to the evaluators was difficulties encountered with the procurement procedures. Many persons felt that they did not understand the procedures and that these procedures caused significant delays. Nevertheless, it must be understood that the UNDP procurement process requires a level of transparency and accountability that the countries had been unfamiliar with to date and therefore viewed as too bureaucratic and not sufficiently country sensitive.

Outputs 1 and 2 were very large contracts which were divided into lots and phases. The contracts were so large that the bidders had to form consortia. Furthermore, these contracts had to be subject to international bidding and had to be reviewed and sanctioned by UNDP HQ. In some instances the tenders had to be re-advertised.

In some instances the Project team was assisted by some countries which participated in the preparation of the TORS; and the technical quality assessors provided much needed guidance not only in the preparation of the TORS but also in monitoring project implementation and providing the necessary quality assurances. There was nevertheless a complaint among those countries which had more capacities that they did not participate in the selection of the contractors. The VI was therefore not happy with the selection of the contractor to undertake their storm surge and tsunami modelling from the beginning. Similarly Anguilla did not like the selection of the one of the contractors in the consortium that had been hired to deliver Output 2. Both these countries felt that the contractors lacked professionalism.

The UNDP, on the other hand has responded to this complaint by the VI stating that the VI was the largest single beneficiary of the project; It was also the case that vendors in the VI were engaged in the project and representatives of the DDM participated on the TMT, the Project Board (including the Chairman), and Procurement committees. Some territories were concerned regarding the influence of a few other territories, including the VI, in the overall project.

The Cayman Islands felt that the contractors who had been hired to develop the criteria for social assessments did not adapt to local conditions. The contractors, on the other hand complained of not being able to receive the type and configuration of data that they needed. This is yet another instance which points to a lack of understanding by a country of what

was needed to accomplish a deliverable and a lack of appreciation by a contractor on data limitations and challenges in a country.

3. UNDP's method of delivery

About 95% of the countries rated UNDP's method of delivery to be very good. They appreciated the consultative approach and the attempts that were made by UNDP to ensure that the beneficiaries were involved in decision making. No doubt some countries would have liked to have been more involved in the selection of contractors; and some countries would have also liked to have been more involved in providing technical assistance to the project. One lesson for future projects is to determine how much more needs to be done to involve countries in decision making in a project which is regional in scope and in which the participating countries have different capacities and different expectations.

Curaçao expressed concern that with language being a barrier, more attention was paid to the English speaking countries that therefore benefitted more from the project. This country also felt that the UNDP was not sensitive enough to the different cultural and political variances that existed between the countries.

The VI notes that UNDP was not responsive to its circumstances. This was communicated by the Premier to the UNDP when BVI was asked to support the one year extension.

4. UNDP as the Implementing Agency

All countries with the exception of one, agreed that UNDP was the best choice for project implementing agency. UNDP traversed across both the Dutch and the English Speaking OCTS. More importantly, countries noted that the UNDP had access to other UN organisations. This proved to be very useful for the project.

The coastal and inland modelling that Sint Maarten was provided was undertaken through a MOU with UNESCO IHE. The Jet Ski bathymetric data collection was also undertaken through this MOU. The BVI too benefitted from this MOU. Memoranda of Understanding were also created with REMPEITC which provided the training in oil spill prevention and contingency planning. Coordination was also established with other ongoing activities in the field of EWS, and in particular with UNESCO-IOC (on tsunami hazards) and WMO (on hydrometeorological hazards). Training on installation and operation of the EWMIN was provided to 15 country representatives in cooperation with UCAR JOSS. The Project also collaborated with NASA to get free satellite pictures for the Jet Ski/satellite methodology employed in the coastal modelling for Sint Maarten.

Sustainability

- Measures the extent to which benefits of initiatives continue after external development assistance has come to an end.
- Assessing sustainability involves evaluating the extent to which relevant social, economic, political, institutional and other conditions are present and, based on that assessment, making projections about the national capacity to maintain, manage and ensure the development results in the future.

Source: UNDP HANDBOOK ON PLANNING, MONITORING AND EVALUATING FOR DEVELOPMENT

These partnerships with other UN Organisations not only brought world class technical assistance to the project but it did so at much less cost than if the project had to access such expertise from the open market.

SUSTAINABILITY

1. How will the outputs be sustained?

Countries as well as the UNDP are, understandably, concerned about the sustainability of all the outputs delivered through the project.

One of the most important outcomes of R3i is that it has created a strong network for the countries that can now depend on each other for technical assistance and guidance. Through the project the BVI's Department of Disaster Management also has the capacity now to

undertake landslide assessments and to produce landslide maps. The BVI is willing to share this expertise, together with its expertise in shelter management, BCM, SAR and safer buildings, with other countries in the Caribbean. Similarly Anguilla and Montserrat are willing to share their experience in EWS and Search and Rescue.

Countries, in general, are concerned that they will not be able to sustain and update the vulnerability assessments and hazard maps that have been produced for them. Montserrat does not think that given the country's economic climate that software licenses will be upgraded on a regular basis.

Despite their trepidations on how they will sustain project outputs countries acknowledge that the capacity enhancement that they have received will help them to continue some of the work in Output 1 through in-country, inter- agency cooperation. Montserrat, for instance feels comfortable that its capacities have improved at all levels - all levels, systemic (protocols and processes) institutional (hardware and software) and individual (training and skills) - and this will augur well for sustaining the project outputs.

Aruba stated that it has mainstreamed R3i into its Department's work plan and a budget has already been submitted for sustaining project outputs. There also plans in place to prepare necessary policies and legislation to provide the necessary enabling environment for these outputs.

The Cayman Islands stated that a Review Panel has been established to ensure that the project outputs - adaptation of social vulnerability model; integration of hazard maps and

vulnerability and loss assessments; further enhancement and greater sharing of GIS information (copyrighted by Land and Surveys) and now available for free to public sector; and transfer of USAR training to a wider cross section of the public – are sustained and integrated into disaster management initiatives in that country.

Curaçao intends to sustain the project outputs in a number of ways. The Urban Search Rescue Team that was established and trained through the project will be absorbed into the Fire Department. A committee will be established for managing the coordination of ongoing hazard mapping; vulnerability assessment and hazard maps will be maintained by a select team from the Fire Department, the Met. Office and the Public Works Department. The next annual budget has already been submitted but in the interim, this team will combine its budgets to continue elements of the project. Curaçao acknowledges that human resource capacities will remain the major challenge, especially to continue data collection and data input into the system but the committee for coordinating hazard mapping and vulnerability assessments will work towards mitigating this barrier by using locally trained experts.

Sint Maarten hopes to sustain the training that it has received through the project by transferring funds from its “Calamity Budget” to disaster management.

Turks and Caicos will endeavour to sustain the outputs that it had received from Output 1 (geo data collection) through the Geodata Task Force and from the SAR training (Output 3) through the Emergency and Rescue Task Force (TCERT). It also intends to develop GIS policy and Standards as well as an enabling framework for geodata collection and management.

While countries have expressed their intention on how they expect to sustain the project outputs mention must be made of the few concerns that were expressed. In the case of the multi-country CAP alerting system, each of the pilot countries was provided with a 3 year maintenance contract. The issue here is that Anguilla is not particularly happy with this vendor and has already complained that the vendor did not react timely to a problem that arose during installation of the server. The complimentary question to this issue then is who will coordinate the maintenance contract and undertake necessary “fire fighting” between the vendor and the countries in the absence of UNDP.

The BVI did not receive the maps which was one of the critical deliverables for Output 1 for that country. The BVI does however have national capacity to produce the maps. Unfortunately no resources had been allocated for this exercise in the 2013 budget. Be that as it may, the meta data and other data received through Output 1 will be integrated into the national GIS grid and will be used by all national agencies involved in development planning in that country.

The contractors and the technical experts are concerned that the outputs have been developed outside the necessary enabling framework of policies, legislation, protocols and institutional strengthening that would situate disaster management with the larger development context and clearly identify roles and responsibilities of each of the

stakeholders involved in disaster management. The lack of sufficient dedicated funding is also of worry to these contractors and technical experts who consider the lack of funding to be a major threat to the long terms viability of these initiatives. Sustainability plans were developed for some of the project activities. What is not clear is whether these plans have actually been approved by the respective governments.

2. Maintaining the enhanced capacities

Countries expressed concern that their respective disaster management agencies lacked necessary human resources. Although the capacities of these agencies had been greatly increased through the training and new equipment received through the project, these agencies needed more staff to be better able to manage the on-going work that has resulted from the project: They have received many tools but do not have adequate staff in house to make full use of them.

PROJECT RATING

1. Efficiency and effectiveness of use of EU funds “A” RATING

In addition to the 4 criteria outlined and discussed above the evaluation also considered whether the EU resources were used efficiently and effectively. The Project Coordinator has confirmed that close to 99% of the funds have been used. Of that amount only about 7% was used for project administration; and additional 7% went towards UNDP's administrative charges. All remaining funds went towards delivery of the project outputs.

Most regional projects of the nature of R3i consume at least 30% in administrative costs and countries have often complained that they do not materially benefit from such regionally designed projects.

This component of the evaluation received an “A” rating.

2. Progress towards outputs “A-” RATING

The project has delivered all the outputs as identified in the 2012 revised results and results framework and as identified in the R3i Project Document. At the time of the evaluation some countries were yet to receive some more of the deliverables while deliverables for some countries were cancelled because of the lack of funds or because there was no time left for continued project implementation. Some countries were not satisfied with the quantity and quality of the deliverables that they had received.

Thus this component of the evaluation receives an “A-” rating.

3. Progress towards outcomes “B+” rating

As stated in Chapter 1, it is too early to evaluate on progress towards outcomes. While more than 95% of the outputs have been delivered some countries have not as yet reviewed and commented on the deliverables. Furthermore the success of Outputs 2 and 3 can only be assessed after a hazard event or an event for which the training and equipment provided for Urban Search and Rescue is put to effect. Finally, Outcome Indicators provided in the Results and Resources Framework are also poorly formulated and vague at best.

Having said the above there are, nonetheless, some indications that allow for some commentary on progress towards outcomes.

- i. All countries agree that the capacities of the disaster management agencies have been improved, some more significantly than others. Capacities were also built in other agencies in GIS, vulnerability assessments and hazard mapping; urban search and rescue; and early warning systems. Such capacity enhancement has and will continue to contribute towards enhanced comprehensive disaster management in the OCTs in the Caribbean.
- ii. The vast majority of the countries have already identified mechanisms and modalities for mainstreaming elements of the project into national work plans and budgets.
- iii. The project brought about a shift in paradigm in disaster management in many of the countries, especially the Dutch OCTs. Additionally, the project introduced new techniques (bathymetric data collection through the use of Jet Skis; CAP multi island EWS; loss estimations and vulnerability curves; landslide mapping and cut slope techniques; etc) that will contribute significantly to enhancing comprehensive disaster management in the region. Many of these are also best practices that can be scaled up to the rest of the Caribbean.
- iv. The project has provided a platform for the OCTs to work together and to source technical assistance from each other.
- v. Although the principal beneficiaries of the Project are disaster management officials, other stakeholders also included GIS-related departments, meteorological services, fire and police, hospitals and the Red Cross. There were also a number of international partners who helped to implement the project, including UNESCO IHE, NASA, REMPEITC, and UCAR JOSS. There were also meetings with WMO, Conseil General de Martinique and UNESCO-IOC
- vi. There is sufficient evidence to show that the UNDP partnership was very valuable to the project. The UNDP Project Team was considerate to national needs and concerns; attempted to resolve issues in a timely manner; and sought to create

strategic alliances with other UN Organisations which benefitted the project. Numerous examples have been provided of these benefits in the section above.

The indicators of progress towards outcomes earn the project a “B+” rating.

4. Relevance of outcomes “Neutral” RATING

The relevance of outcomes cannot be determined by this evaluation. As such this outcome will be rated as, “Neutral”.

CHAPTER 5

5.0 CONCLUSIONS AND RECOMMENDATIONS

The previous contains substantive discussions resulting from an evaluation of the project from the perspective of the outputs that were delivered; and the outcomes of the project from the perspective of its relevance, effectiveness, efficiency and sustainability. Some discussion was also included on the role of UNDP in project implementation.

It now remains for the evaluation to summarise the conclusions of the evaluations based on the presentations in the previous chapters, and to provide recommendations, including some lessons learned. For ease of reference, the recommendations will be divided into strategic recommendations and action oriented recommendations.

When reading this Chapter, the following must be kept in mind:

- i. The evaluation took place even as some of the project activities were still undergoing implementation; some countries had not received their deliverables; and some countries had received their deliverables but were still reviewing and commenting on them.
- ii. The evaluation itself was very rushed. Although 55 days had originally been allocated for the evaluation and it was slated to start on November 1 2012, the time for the conduct of the evaluation was reduced to about 25 working days. The scope of the evaluation, however, remained the same. The evaluation was also interrupted by all of the Focal Points not being available for a week because they had gone to Jamaica to attend the CDM Conference. The evaluation was also interrupted by the Christmas holidays and by the fact that a number of the project focal points were on leave.
- iii. With all the interruptions and difficulties in flight arrangements, the evaluation team was only able to visit Cayman Islands, Aruba, Curaçao, Bonaire, VI, and Anguilla. Sint Maarten and Montserrat. Interviews with Turks and Caicos were held remotely. The evaluation did not cover Sint Eustasius and Saba, both of which (together with Bonaire) were involved in becoming municipalities of the Kingdom of the Netherlands in October 2012 and there was much uncertainty of whether they were eligible to participate in the project.
- iv. Two members of the evaluation team went to Jamaica to ensure that all the project Focal Points were met and were sensitised about and prepared for the evaluation.

In addition it also provided the opportunity for meetings with some of the contractors and technical experts who were present in Jamaica. In the end at least 95% of the contracting firms and vendors, and technical experts were interviewed.

- v. The volume of project documents that the evaluation team had to assimilate was mind boggling to say the least. What made it more difficult was that some of the reports were poorly written; there were also variances in the technical quality of the reports.
- vi. Feedback from interviews and reports varied from country to country and expert to expert. Different people had different perspectives on what could be done better in managing the project for more efficient and effective outcomes. To a certain extent, opinions simply reflected personal expectations about the outcomes of the project. However, this in itself is telling, because it indicates that outcomes were not articulated at a level of specificity that could be measured concisely.

The following, then, are the conclusions and summary recommendations where there was consensus amongst stakeholders and “hard” evidence to support conclusions.

5.1 Conclusions

It has been noted throughout the report that this was an ambitious, complex project. It introduced concepts of cross country cooperation not often encountered between the OCTs in the Caribbean. It was therefore expected that issues would be encountered in the development of the project and its execution. Nevertheless, staff of national agencies interviewed all agreed that this project was well managed and spoke positively about the UNDP project team. Overall, the project did achieve the objectives stated.

This project was announced and officially commenced in January 2009 with an original completion date by the end of 2011. It had to be extended one year and there are still some projects that are incomplete. In discussions with stakeholders and the project coordinator, there were some opportunities identified that might have improved the planning and execution of the project. First, it would have been useful to have had the project team in UNDP in place well in advance of the project’s commencement. The project coordinator joined the project in 2010.

Second, as was noted earlier in this report each country was at a different level of capacity in terms of its understanding of disaster management. While consultants were sent to the countries to help them develop their needs and priority assessments, reports from consultants and field experts suggested that requests from the field were either “vague” or unrealistic. This information was then inputted into terms of reference for Requests for Proposals that consultants indicated needed to be re-worked once on the ground. As a consequence, work fell behind. The problem was then compounded because there were delays in approving the extension of the project as it became obvious that deadlines were not going to be met. It may be unrealistic to expect staff in the countries to understand the

detailed requirements of a project of this nature without some prior experience and sufficient capacities to be able to fully articulate their needs.

The project provided a very important forum for the OCTs to share experiences and to learn from each other; and knowledge sharing in general. There was also substantial exposure to new approaches in various aspects of disaster management. The only concern here is the rate of assimilation of all this information and new knowledge in those countries where capacities were limited to start with.

Evaluators heard a number of instances where working relations between government agencies and between the OCTs themselves were strained. The evaluators also heard that there were benefits that accrued as a result of staff interacting with one another and learning from the past successes and failures of countries that had prior working experience with disaster management. Evaluators were also consistently reminded that the UNDP's approach to working with individual countries and territories to determine their priorities was viewed positively.

There appears to have been less cooperation where stakeholders were not engaged. There were documented instances where some agencies were reluctant to provide information to their counterparts and there continue to be concerns about the sustainability of the work done because stakeholders immediately outside of the project e.g. legislators, policy staff and politicians have not been fully apprised of their roles to ensure a continuing disaster management program.

5.2 Lessons Learned

Despite some of the downsides to the project the R3i has shown that a project can be centrally coordinated and managed while benefits redound at the national level. There were indeed many hiccups in project implementation and each country has its own version of how it would have liked to see the project implemented. This is only natural. The fact however remains that this complex project with a broad technical and geographical scope was able to achieve its objectives. There are thus a number of lessons to be learned:

- vi. The project's governance structure ensured that countries participated in the decision making. Countries were represented in the Project Board which was chaired by the Financial Secretary from one of the countries. All countries participated in at least one of the Technical Management Teams which were responsible for preparing terms of reference and for the selection of the contractors.
- vii. UNDP ensured that country concerns were always resolved in a timely manner, especially those concerning the contractors and vendors. In some instances UNDP also assisted the countries in seeking political support and endorsement for the project.

- viii. Project meetings were rotated through the countries; where feasible additional meetings were held through electronic means thereby ensuring that country focal points were always kept informed about the project.
- ix. The technical experts who were retained to provide technical guidance and quality assurance to each of the technical outputs helped to ensure that countries had access to technical backstopping for preparing terms of reference and for monitoring quality assurances on project activities.
- x. Personality issues are always rampant in complex project with so many different layers of stakeholders each with their own expectations. In some instances there were misunderstandings between the countries and the contractors; in others, countries felt that the technical experts took the side of the vendors; and in rare instances there was disagreement between a country and the project team. What is important however is that the project team in UNDP undertook to resolve these issues as quickly as possible and they did not have any material impact on the project.
- xi. Complex projects need sufficient time during project initiation. The 2010 B-Tool Assessment clearly indicated that there were differences in capacities between the countries. Yet the project outputs were designed using a single template and everyone came on board at the same time. How this will play out can only be determined after the project deliverables have been given at least a couple of years to take effect (or disappear) in each of the OCTs. All of these OCTS have very small populations and the turnover in the public service is very high. How many persons will remain in their present jobs and be able to use the training and tools provided by the project is yet to be seen. On the other hand this is a universal project risk that cannot be readily mitigated.
- xii. Complex and overly ambitious projects need sufficient time for implementation. The outputs for R3i were all rushed into a 3 year implementation period. The integrity and quality of these outputs will only be known when they become fully operational and fully tested.
- xiii. One of the outcomes of the project was anticipated to be regional integration. The project did indeed bring together 10 OCTs together each belonging to one of two groups of languages. At the same time there is a sense that the project operated in isolation of what was going on in comprehensive disaster management in the rest of the Caribbean. This was ironical because the UK OCTS are members of CDEMA and they actively participate in regional projects and in regional fora. There is also no evidence that the R3i sought to apply lessons learned and best practices from other similar regional projects.

5.3 Recommendations

5.3.1 Strategic recommendations

- viii. A long term concern in the Caribbean is the impacts of climate change and climate variability. To date, R3i has built on identified evidence of higher sea levels and has taken this into account for instance on Storm surge modelling. The project has developed the potential to track and report on information that could form an important part of the dialogue on climate change at a world level, not just for the Caribbean but for all small island communities. The project also set up a structure and number of forums where international experts and national and regional stakeholders could meet discuss these issues. There could be tangible long term advantages to pursuing this activity and keeping these issues in the public eye.
- ix. There are many lessons to learn from R3i and these lessons should be incorporated into any regional project on disaster management in the Caribbean. The Disaster Risk Reduction that is presently being designed by the CDB and CDEMA will be well placed to review the experiences of R3i, especially this proposed project is to be funded by the EC's Disaster Risk Reduction Envelope for the 10th EDF.
- x. Experience in the design and implementation of regional projects in the Caribbean shows that participating states always come to the project with a wish list of all the activities that they want to undertake - for which they do not have the resources - and then some. It is important to filter this wish list very carefully to ensure that interventions are consistent with capacities, priorities and national needs.
- xi. It is important for regional projects to ensure that national expectations are consistent with only what the project can deliver within the stated time and budget allocation. Dissatisfaction usually results when expectations far exceed what the project can deliver and this unfortunately then impacts on the effectiveness and efficiency with which the project was delivered. It will also impact on the sustainability of the project outputs at the national level.
- xii. Regional projects must be designed to allow for exchanges of experiences, lessons learned and to source and provide technical assistance to other regional projects.
- xiii. The Project Coordinator is not from the Caribbean and although there were some quiet rumblings about the fact that he was not culturally sensitive, he performed remarkably well and the vast majority of the countries and contractors had only positive things to say about him. Fortunately his expertise is not lost to the region after December 31st 2012. He was understudied by a Caribbean team member who now has the capacity and skill sets to manage a similar project. The lessons learned from the R3i is that Regional projects need to ensure that expertise in the management and coordination of such complex projects can be retained in the

region by ensuring that an external project coordinator is understudied by a regional person

5.3.2 Action oriented recommendations

- v. The project has produced a voluminous amount of technical documentation, including specifications for equipment, terms of references for contractors, etc. All of this information is valuable resource material that should be made readily available to the rest of the Caribbean region in particular, and to small island States in general. The information should also be held in a repository that can be easily accessed in the Caribbean. It is recommended that the UNDP discuss with the CARICOM Secretariat, the use of CDEMA's website to be the repository. Alternatively the Caribbean Community Climate Change Centre may agree to be the repository.
- vi. There is considerable expertise that has been developed in hazard mapping, hazard analysis, early warning systems and search and rescue. This expertise should be made available to other countries in the Caribbean and to small island States in general. The UNDP should develop a database of this expertise so that it can use it in its South-South technical cooperation programmes.
- vii. Although the project activities terminates on December 31st 2012, the UNDP Office for Barbados and the OECS must commit a mechanism that will allow countries to bring forward issues and concerns for resolution on project deliverables that have been received only a few days ago or after the project ends.
- viii. The UNDP should undertake an outcome evaluation in about another 12 to 18 months to evaluate the impact of the project. Although this evaluation has provided a good rating for the project, concerns still prevail over how countries will continue to finance and maintain the deliverables that have been provided to them.

APPENDICIES

APPENDIX 1

TERMS OF REFERENCE FOR THE EVALUATION

1. INTRODUCTION

Recognizing the need of Overseas Countries and Territories (OCTs), small islands in the Caribbean region (11 islands: Anguilla, Aruba, Bonaire, Cayman Islands, Curacao, Montserrat, Saba, Sint Eustatius, Sint Maarten, Turks and Caicos and The Virgin islands), to enhance their regional and national capacities for disaster risk reduction, the EU granted funds to UNDP Barbados and OECS to implement a Regional Risk Reduction Initiative (R3I).

Hence the Regional Risk Reduction Initiative (R3I) seeks to address the risk and exposure of the Dutch and British small island overseas countries and territories by developing the capacity, knowledge and tools to enable the mainstreaming of disaster risk management consistent with the Hyogo Framework for Action (HFA).

Funded by the EU in the amount of €4.9m, the project is directly implemented (DIM) by UNDP Barbados and the OECS over the period 2009 to 2012. The initial 3-year period was extended by 1 year to run until 31 December 2012.

The project is organized around 5 outputs as follows:

- Output 1: Capacity of OCTs in CDM in relation to hazard mapping and vulnerability assessments increased
- Output 2: Early Warning System (EWS) feasibility study and pilot implemented
- Output 3: Capacity built in response, rescue and recovery
- Output 4: Technical assistance provided for local disaster management institutions and implementing partners
- Output 5: Coordination, training and dissemination

These outputs, covering a broad range of Comprehensive Disaster Management constitutive elements, aim to achieve the intended following outcome: “Enhanced regional and national capacities for disaster risk reduction associated with natural, environmental and technological hazards, within the broader context of climate change, and for effective recovery”.

The principal beneficiaries targeted were the stakeholders within the national disaster management system. This consisted mainly of the disaster management offices, which served as the project’s focal points for coordination of activities within the countries. Other stakeholders included the GIS-related departments, meteorological services, fire and police departments, hospitals and the Red Cross.

Partners which helped to implement or facilitate various activities included UNESCO-IHE, RAC REMPEITC, NASA and UCAR JOSS.

Given the complexity of the project, involving 11 islands, each at varying levels of capacities, and covering many different areas of expertise related to disaster management it was decided to benchmark countries’ overall national disaster management capacities through the use of the Vulnerability Benchmarking Tool (B-tool).

This comprehensive exercise, conducted during May-June 2010 in each beneficiary country, became an appropriate indicator of the project, allowing a comparative evaluation of countries progress towards the intended outcome of the project stated here above. Further, the scoring system of the B-tool allows a synthetic view of the results and serves, beyond the objective of the R3I’s evaluation, as a reference for the countries decision makers.

Hence the present Terms of Reference include specifically **an actualization of the B-tool exercise**, which shall result in new B-tool reports for each country. A substantive part of the evaluator’s work (estimated at approximately 50% of the budget) shall be dedicated to this second B-tool assessment.

It is worth noting that during the course of the project, 3 of the beneficiary islands: Bonaire, Saba and Sint Eustatius (BES islands), changed their political status to become municipalities of The Kingdom of the Netherlands. This important change, which took effect on 10/10/10 had deep reorganizational consequences in these three islands, which affected the ability of stakeholders there to adequately take advantage of the project. Today, the BES islands may be considered as 1 entity the Caribbean Netherlands.

It is foreseen that a team will be necessary to carry over the work required. The terms of reference below refer to this team as “the consultant” or “consultants” or “the evaluator” or “evaluators”

2. OBJECTIVES OF THE EVALUATION

This exercise is the final project evaluation, which is intended to demonstrate the level of change in the measured variables and level of success of the outputs and outcome achieved. This will contribute to an analysis and assessment of:

- The relevance of the project, and in particular its regional dimension
- The effectiveness and efficiency with which the EU's resources have been used
- The usefulness and sustainability of the results for the beneficiaries
- UNDP's performance as a development partner
- UNDP's contribution to the expected result

In addition a substantial output from this evaluation will be the B-tool assessment, which will:

- Measure the evolution of project's outcome indicator, and thus inform the overall evaluation.
- Provide countries with a second clear, comparable and informative benchmarking assessment of their respective disaster management capacities.

The evaluation will be used by all main parties (beneficiary countries, UNDP, EU) to assess their approaches to development assistance and to design future interventions.

Recommendations are expected as to:

- The extents to which project's outputs are sustainable and replicable.
- Orientations to take in the design of Caribbean regional projects in the field of disaster management.

3. SCOPE OF THE EVALUATION

Timeframe: 1 November to 24 December 2012

Period to consider: 1 January 2009 to 15 December 2012. However prospects for sustainability and impact will be made for beyond this period.

Geographic scope: The mission shall start and end in Barbados. Then, the 9 following islands must be visited: Anguilla, Aruba, Bonaire, Cayman Islands, Curacao, Montserrat, Sint Maarten, Turks and Caicos and The Virgin islands. Questions relevant to Saba and Sint Eustatius can be resolved remotely or through meetings in Bonaire.

Stakeholders to meet:

In Barbados: R3I team in UNDP (will provide all necessary contacts and documentation), EU Delegation, UKAID.

In beneficiary countries:

- The R3I focal point in the OCTs, i.e. the head of the disaster management department.
- The Project Board Chair (Financial Secretary of BVI) and the Project Board Alternate Chair (Territorial Authorizing Officer of Aruba)
- Other national stakeholders as determined relevant by R3I's focal points.

Domain of interest: Disaster Risk Reduction

3.1 Contribution to the outcome

This evaluation will cover all outputs of the project since its inception in 2009 and for each of the beneficiary countries. Results delivered can be summarized as follows:

	Output 1	Output 2	Output 3
	Hazard Mapping and Vulnerability Assessment	Early Warning Systems	Response, Rescue and Recovery
Anguilla	Geodetic and aerial LIDAR survey. GIS technical assistance and trainings	Leading EWS country. New CAP server. Warning systems. Public outreach and education (POE)	Emergency telecommunication equipment. Oil spill training. BCM training
Aruba	Preliminary and structural vulnerability assessments. GIS training.	Pilot country for CAP-based early warning system. Integration assistance. POE	Emergency telecom equipment. Search and rescue (SAR) training and equipment. Oil spill and BCM training
Bonaire	Preliminary and structural vulnerability assessments. GIS training.	EWS capacity assessment and recommendations.	SAR capacity assessments. BCM training
Cayman Islands	Quantitative risk assessment and loss estimation studies. GIS training	EWS capacity assessment and recommendations.	SAR training and equipment. BCM training
Curacao	Preliminary and structural vulnerability assessments. GIS training.	EWS capacity assessment and recommendations.	Emergency telecom equipment. SAR training and equipment. BCM training
Montserrat	Preliminary and structural vulnerability assessments. GIS training.	Pilot country for CAP-based early warning system. Integration assistance. POE	Emergency Telecom Equipment and training. BCM training.
Saba	Capacity assessment and GIS training	EWS capacity assessment and recommendations.	SAR capacity assessments. BCM training
Sint Eustatius	Capacity assessment and GIS training	EWS capacity assessment and recommendations.	SAR capacity assessments. BCM training
Sint Maarten	Innovative bathymetric survey. Inland and coastal flood modeling. Landslide assessment.	Pilot country for CAP-based early warning system. Integration assistance. POE. Cell broadcast study	SAR capacity assessments. Oil spill and BCM training.
TCI	Preliminary and structural Vulnerability Assessments. GIS training.	EWS capacity assessment and recommendations.	SAR training and equipment. BCM training
Virgin Islands	Tsunami and storm surge modeling. Topographic and bathymetric data. Cut-slope assessments. GIS training	EWS capacity assessment and recommendations.	Emergency telecom equipment and training. BCM training. Provider of shelter management training.

In addition, output 4 (Technical assistance) provided expertise in the fields of coastal hazard, early warning systems, geology and hydrology. Output 4 also provided the first benchmarking capacity assessment (B-tool) in 2010 and access to regional seminars and training.

Output 5 (Coordination, training, dissemination), provided visibility and knowledge products, as well as the project coordination team and regional coordination meetings (Technical Management Teams and Project Board)

The evaluation must encompass all results achieved under the project in order to evaluate their contribution to the outcome.

3.2 Vulnerability Benchmarking Tool (B-Tool) exercise

The evaluators will conduct a second B-tool exercise in all countries, hence assessing precisely the improved status of their capacities in terms of disaster management.

In order to perform the assessment more effectively:

- Some parts of the previous assessment (June 2010) may remain unchanged if the evaluator estimates that no evolution has occurred. In particular, the team may focus efforts on the Risk identification and disaster preparedness section of the B-tool
- The evaluation for Bonaire, St Eustatius and Saba and may be gathered in one, since BES islands are now, in theory, part of the same country.

3.3 Specific issues to consider

The scope is also expected to include documentation of lessons learned, findings and recommendations in the following areas:

- Opportunities and challenges brought by UNDP as direct implementing partner in Caribbean regional programs in the field of disaster risk reduction (domain of interest)
- Potential and effective contribution by countries themselves to their own development and to the development of other countries in the field of interest.

4. EVALUATION QUESTIONS

The evaluation should answer, at least, the following orientation questions in the following matters. However, the evaluation team shall complement this listing in its methodological proposal (evaluation matrix) in order to comply with the objectives and scope of the evaluation.

The evaluators will seek to answer the following questions:

In assessing **relevance**:

- To what extent is UNDP's engagement a reflection of strategic considerations, including UNDP's role in a particular development context and its comparative advantage?
- To what extent was UNDP's selected method of delivery appropriate to the development context?
- Is the initiative aligned with national strategies?
- Is it consistent with human development needs and the specific development challenges in the country?

In assessing **effectiveness**:

- To what extent have outcomes been achieved or has progress been made towards their achievement?
- Did the project implementation contribute toward the stated outcome? Did it at least set dynamic changes and processes that move towards the long-term outcomes?
- How have corresponding outputs delivered by UNDP affected the outcomes, and in what ways have they not been effective?
- What has been the contribution of partners and other organizations, especially beneficiary countries organizations, to the outcome, and how effective have UNDP partnerships been in contributing to achieving the outcome?
- What were the positive or negative, intended or unintended, changes brought about by UNDP's work?
- Who are the main beneficiaries?

In assessing **efficiency**:

- To what extent were quality outputs delivered on time?
- Has the project been implemented within deadline and cost estimates?
- Have UNDP and its partners taken prompt actions to solve implementation issues?
- What impact has political instability had on delivery timelines?
- Were UNDP resources focused on the set of activities that were expected to produce significant results?

In assessing **sustainability**:

- What indications are there that the outcomes will be sustained, e.g. through requisite capacities (systems, structures, staff, etc.)?
- To what extent has a sustainability strategy, including capacity development of key national stakeholders, been developed or implemented?
- To what extent are policy and regulatory frameworks in place that will support the continuation of benefits?
- To what extent have partners committed to providing continuing support?
- What issues emerged during implementation as a threat to sustainability? What were the corrective measures that were adopted?
- How has UNDP addressed the challenge of building national capacity in the face of high turnover of government officials?

5. METHODOLOGY

The consultant will propose and use a methodology taking into account the following points:

- The methodology of the B-tool will be used to obtain B-tool results. The B-tool results will be used as an indicator of progress towards the project's outcome.
- Field visits must be conducted to Barbados and at least 9 countries.
- All needed documentation can be obtained directly from the UNDP project team. Hence no gathering of data or document is necessary from the countries.
- In-country visits will include meetings, interviews and potentially site visits. The existence of some project outputs may also be verified in-country, thus implying some field visits or visits to departments other than disaster management.

- R3I's focal points in each country may provide assistance for additional in-country contacts and meetings. The revision of the countries' capacity according to the B-tool may require the participation of persons from agencies other than disaster management.
- While it is considered a good practice to inform countries in advance of the coming of evaluators and to give them advanced notice as to the work to be accomplished, it is recommended to avoid asking countries' stakeholders to answer lengthy questionnaires remotely. Evaluators are responsible for the cohesiveness of the B-tool answers and other evaluation answers. Evaluators must limit the uncertainties linked to the interpretation of question. Hence face-to-face meetings are preferred to remote communication.
- The contracted firm is responsible for evaluators' logistical arrangements. The consultant should start and end work in Barbados.
- The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact**, as defined and explained in the UNDP Handbook on Planning, Monitoring and Evaluating for Development Results (PME Handbook)¹³

5.1 Indicators to consider

Indicators are specified in the Results and Resources Framework of the Project Document annexed to the present terms of references.

It should however be noted that for the purpose of this evaluation, the outcome level indicator may be developed as follows:

- % increase in risk management index for risk identification (RMI_{RI})
- % increase in risk management index for disaster preparedness (RMI_{DP})
- % increase in total disaster risk management index (TDRMI)

The baseline will be the results of the Vulnerability Benchmarking tool (B-tool) 2010 in OCTs.

The targets:

- 15% average increase in RMI_{RI} across all OCTs (i.e. 50% to 65%)
- 15% average increase in RMI_{DP} across all OCTs (i.e. 61% to 76%)
- 10% average increase in TDRMI across all OCTs (i.e. 51% to 61%)

While this evaluation is pitched at outcome level, it may also be useful to consider that indicators found in the Project Document at output level may be completed/specified with the following indicators, which may give a better measure of project's outputs:

Output 1:

- Number of national GIS databases updated with geospatial datasets and vulnerability information
- Number of national personnel trained to collect and manage geospatial data

Output 2:

- Number of countries with operational EWS pilots

Output 3:

- Number of training activities completed to improve local capacities

¹³ Available at : <http://web.undp.org/evaluation/handbook/>

- Number of national policies formulated or revised

Output 5:

- Number of new joint activities executed based on common priorities

6. EVALUATION PRODUCTS (DELIVERABLES)

The evaluation team shall produce, in English:

1. A brief inception report

This report will be submitted to UNDP at the end of the preparatory period in Barbados. It shall confirm the schedule of visits, the methodology adopted and the assumptions made.

The inception report shall provide an opportunity to verify that that UNDP and the evaluators share the same understanding about the evaluation, and shall clarify any issues at the outset.

This represents a general planning document of the Evaluation Mission, which includes a calendar of the main stages and activities planned and deliverables. This report shall detail the understanding of the evaluators on what are they going to evaluate and why, showing how each evaluation question shall be answered and by which means: the proposed methodology, the proposed information sources, and the data recollection procedures. This information shall be reflected in an evaluation matrix, for example:

Evaluation criteria	Evaluation questions	Performance indicators	Data sources	Approach and design	Sampling methods	Methods and tools for data collection	Methods for data analysis

2. Draft evaluation report

A draft evaluation report shall be submitted upon return to Barbados (or preferably before). This draft evaluation report shall at least include the following elements as detailed in the Annex 7 of the PME Handbook, and shall not surpass 50 pages:

- The title and opening pages
- Draft table of contents
- List of acronyms and abbreviations
- Draft executive summary
- Introduction
- Description of the intervention
- Evaluation scope and objectives
- Evaluation approach and methods

The following elements may be started or in very draft version before return to Barbados:

- Data analysis (B-tool)
- Findings and conclusions
- Lessons learned

The report annexes may be partly provided at the level of submission of the draft report:

- ToR for the evaluation
- B-tool reports for each country
- Regional B-tool synthesis

- List of stakeholders interviewed
- List of supporting documents reviewed
- Results and Resources Framework
- Short biographies of evaluators and team composition
- Code of conduct signed by evaluators

3. Final evaluation report

The draft evaluation report will be reviewed by UNDP and countries' focal points during the period of time (3-5 days estimated) which the evaluators will take to write the complete evaluation report. It is thus essential that main findings and recommendations are shared informally during the mission with the relevant stakeholders.

The final Evaluation report must comply with the quality standards set up in Annex 7 of the PME Handbook.

The final report shall also address the following:

- A rating on progress towards outcomes and progress towards outputs;
- A rating on the relevance of the outcomes.

The Final evaluation report shall include in annex:

- Each country's B-tool report
- A regional synthesis of the B-tool results (refer to the Executive Summary of the B-Tool 2010)

These reports shall be written and structured in a way that they can also be read and edited independently from the final evaluation report.

It is expected that at the conclusion of the exercise, the evaluation team will produce 15 CD copies containing a single document of the above reports, as well as separate documents of each national B-Tool report and the regional synthesis.

7. EVALUATION TEAM

The composition and size of the team is largely at the discretion of the consultant, who will detail it in the offer, taking into consideration the following:

- UNDP Barbados and OECS anticipates that the team will include two individuals with a minimum of 7 years' experience each of evaluating projects and programmes, preferably at outcome level and as per UNDP's guidelines, with a strong emphasis on disaster risk reduction or within the Caribbean region
- The team must include at least one member with at least 3 years of experience in disaster risk reduction or related field, preferably in the Caribbean or small island developing states (SIDS).
- The short timeframe of the project, and the number of deliverables to be produced, including the extensive B-tool vulnerability assessments, may justify larger teams, and a distribution of countries among team members.
- Each member shall be fluent in English, with excellent writing and analytical skills.
- Recruitment of local consultants for facilitating the review, and knowledge of Dutch and Papiamentu are assets.

The consultant shall provide detailed résumés for each team member, as well as work samples and references when available. Work sample and references are not compulsory; however they will support the bid.

Evaluators must be entirely independent from any organization or firm that has been involved in designing, executing or advising the R3I project. Statements of independence from the project shall be included in for each evaluator.

8. EVALUATION ETHICS

Evaluations in UNDP shall be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'¹⁴

In particular, evaluators shall apply anonymity and confidentiality protocols to safeguard the rights and confidentiality of information providers.

¹⁴ Available at <http://www.uneval.org/search/index.jsp?q=ethical+guidelines>

Specific attention will also be brought to the potential interaction between evaluators and the media, and information disseminated to the public. Information related to disaster risk reduction can be potentially sensitive in economies highly reliant on tourism.

9. IMPLEMENTATION ARRANGEMENTS

UNDP will provide a pre-evaluation briefing to the evaluation team, after which the consultants are expected to conduct evaluation activities in countries. Consultants will then provide a de-briefing to UNDP upon return from the countries.

A suggested schedule is proposed as follows:

Place	Activities	Duration in working days
Inception	UNDP to provide contacts	5 days
Barbados	Meeting with the UNDP team Review of documentation Finalization of logistical arrangements	2 to 3 days
Countries	Meeting with R3I focal points Meeting with Project Board Chairs Site visits, interviews and potential meetings with other local stakeholders (e.g. Land Registry, Planning, GIS, first responders, etc) National B-tool review with a committee set up in collaboration with the R3I focal point B-tool report writing Ongoing draft report writing	30 days
Barbados	Ultimate information meeting with UNDP Debriefing with UNDP and EU Final report writing Integration of comments on draft report Delivery of Final report	4 to 5 days

During their stay in Barbados, UNDP will provide office space and desk for a maximum of 2 evaluators. The team members must be equipped with their own laptops and cellular communication means.

10. BUDGET

The estimated budget for the evaluation and B-tool cannot be disclosed.

11. DOCUMENTATION AVAILABLE ONLINE

Project description: <http://www.bb.undp.org/regional-risk-reduction-initiative>

Video documentary on R3I outputs 2011: <http://www.youtube.com/watch?v=-IH4r6Ogtl&feature=plcp>

R3I GIS data repository website: <http://r3i.gis-hmva.gesp.it/home>

B-tool methodology and 2010 B-tool assessment reports: <http://r3i.gis-hmva.gesp.it/documents/btools>

Online deliverables of the early warning system (Output 2) component

Country	Public website	Products for public outreach
Anguilla	https://www.anguilla-alerts.net/	http://kynthiaart.com/ews/anguilla/
Aruba	https://www.aruba-alerts.net/	http://kynthiaart.com/ews/aruba/
Montserrat	https://www.montserrat-alerts.net/	http://kynthiaart.com/ews/montserrat/

Country	Public website	Products for public outreach
Sint Maarten	https://www.sint-maarten-alerts.net/	http://kynthiaart.com/ews/sint-maarten/

Facebook page:

<http://www.facebook.com/media/set/?set=a.105810792833505.12895.100002137554720&type=3#!/pages/R3i/154033841325133>

APPENDIX 2

LIST OF DOCUMENTS REVIEWED

Document	Level	Observation
Subregional Programme Documents 2005-2011, 2012-2016	Design	Frame the context of the cooperation between UNDP and the countries served for the designated programming period
R3I Project Document	Design	This document is the foundation of the project. It includes a Results and Resources Framework and indicators
OCT R3I Contribution Agreement between the EU and UNDP	Design	Contract between the EU and UNDP for the implementation of the project
2012 Revised Results and Resource Framework	Design	Revision of budget amounts put on respective outputs. Justification for this revision included.
Project Board and Technical Management Teams Terms of Reference	Design	
Annual Progress Reports (2009, 2010, 2011)	Monitoring	
Project Board minutes	Monitoring	
Result Oriented Monitoring report (March 2011)	Monitoring	
Country output sheets	Monitoring	These simple sheets have been developed to report at a given time and for each country deliverables achieved, ongoing and planned
2010 Disaster Management Capacity Assessment - using the B-tool	Output	Available online. This is an output from the project which serves as Benchmark and indicator of the project contribution to the outcome.
Project output reports	Output	A compilation of all final reports produced by the project
Workshop documents	Output	All presentations made in workshop
Newspaper articles and documentary	Impact	

APPENDIX 3

INTERVIEW QUESTIONS

Interview Criteria	Interview Questions	Comments
RELEVANCE	Is the Project relevant to the Country's priorities and needs?	
	IS this Project aligned with the country's national strategic goals?	
	Is the Project consistent with the existing capacities in the country	
	How UNDP was chosen as the regional implementing agency?	
	Was it an appropriate choice to select UNDP as the regional implementing agency?	
	Is this project appropriate to the specific development challenges of the country	
	Were the outputs delivered according to what was agreed upon?	
	Who were the main beneficiaries of this Project?	
	Did UNDP take prompt actions to solve implementation issues and issues with contractors	
EFFECTIVENESS	Have all the outputs identified for your country been attained	
	Have these outputs met country's objectives for Comprehensive Disaster Management?	
	Was UNDP responsive to your political, social and cultural circumstances?	
	To what extent was UNDP's method of delivery appropriate to your development context?	
EFFICIENCY	Were the outputs for your country delivered within the stated cost estimate	
	Were the outputs delivered on time?	
	Were you satisfied with the outputs that were delivered	
	Were you satisfied with the contractors who delivered the outputs?	
	What are the positive or negative, intended or unintended changes brought about by the Project?	
SUSTAINABILITY	Will the outputs be sustained?	

	Will there be allocations in the next annual budget to continue the work that had been started by the Project?	
	Has the capacity of your agency improved through this Project?	
	How will you maintain this capacity?	
	Do you have the necessary policy and legal frameworks to support the work that has been delivered through this Project?	
	Have other donor partners come forward or have your approached other partners to help you sustain the outputs of this Project?	
	Has the project developed sustainability plans/strategies for sustaining the output(s)?	
	Do you have the resources to implement the recommendations of these sustainability plans/strategies?	
	What issues emerged during implementation as a threat to sustainability	

Criteria	Output 1	Output 2	Output 3
OUTPUT ACTIVITIES			
Were the activities for the output chosen in collaboration with the island			
Why were these specific activities chosen			
Did the activities and outcomes of the activities consider capacity and other resource constraints and challenges			
Have all the activities been completed			
Have all the outputs been delivered			
RELATIONSHIP WITH CONTRACTOR			
Who prepared the TORs for the contractor			
How was the contractor chosen			
What was the nature of the relationship with the contractor			
Were there constraints and challenges in working with the contractor			
Were the outputs			

delivered on time			
UTILISATION OF OUTPUTS			
Are the outputs being utilised			
Which government agencies are using the outputs			
How were persons identified for training			
Are the persons who were trained still using the skills that they had acquired during the training			
Level of satisfaction with outputs			
Which agency is using the outputs			
SUSTAINABILITY OF OUTPUTS			
Will the outputs be used			
Will the outputs be maintained			
How relevant are the outputs			
Are the outputs consistent with government priorities and needs			
What kinds of resources are needed to sustain the outputs			

APPENDIX 4

EVALUATION MATRIX

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
Effectiveness	<p>i. Was UNDP support effective in producing outputs and outcomes</p> <ul style="list-style-type: none"> At the project level At the output level At the national level At the regional level Dissemination of lessons learned to participating countries and partners Which will last time and continue after project implementation To what extent were quality outputs delivered on time Has the project been developed according to stated schedule and time Has UNDP and its partners taken timely 	<ul style="list-style-type: none"> Project outcomes and impacts Existing ratings for project outcomes Aggregated outcomes and impact Catalytic and replication effect Project design, preparation, and implementation have incorporated lessons learned from similar projects implemented by UNDP Availability of financial resources Stakeholders' ownership Existence of a properly function institutional, policy and legal framework for disaster management Level of funding provided by the project compared to other ODA 	<ul style="list-style-type: none"> Relevant project documents Project AWP Results and Resources framework Relevant national strategies and plans Project related documentation Government officials, project staff at the national level and at UNDP, UNDP officials, EU and UKAID officials, civil society organisations Policies and legislation Project related reviews 	<p>Focus Groups</p> <p>One-on-one meetings</p> <p>Review of Project documents</p> <p>Site visits, where applicable</p>

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	<ul style="list-style-type: none"> actions to resolve problems How have delivery times been impacted upon by country politics Were the EU resources focussed on activities that produced significant results 	support for disaster management to the OCTS and to each individual country		
Efficiency	<ul style="list-style-type: none"> Were the pre identified outputs produced as planned and were they produced efficiently Were changes made to the already planned work in subsequent stages How much time, money and effort did it take to formulate and implement the project What were the roles, engagement and coordination among various stakeholders in the project Were there synergies between UNDP and the national agencies Were there 	<ul style="list-style-type: none"> Delivery of output against schedule identified in Results and Resources Framework Are resources concentrated on the most important initiatives or are they scattered/spread thinly across initiatives Length of time taken to deliver each output against Cost of delivering each output as compared to budget provided in results and resources Framework Nature of the relationship between 	<ul style="list-style-type: none"> Relevant project documents Project AWP Results and Resources framework Relevant national strategies and plans Project related documentation Government officials, project staff at the national level and at UNDP, UNDP officials, EU and UKAID officials, civil society organisations Policies and legislation Project related reviews 	<ul style="list-style-type: none"> Focus Groups One-on-one meetings Review of Project documents

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	<p>synergies between national agencies</p> <ul style="list-style-type: none"> • Were there synergies between all the disaster management agencies participating in the project • Were there synergies between UNDP and other donors supporting disaster management projects in the participating countries • To what extent were the outputs delivered on time • Did the project implementation contribute towards the stated outcome • How have the outputs impacted on the outcome – what were the successes and challenges • What were the positive and negative impacts of the project • What have been the contribution of other 	<p>UNDP and the National Focal Points</p> <ul style="list-style-type: none"> • Nature of relationships between national Focal Points and other national agencies who participated in the project • Nature of the relationship between Focal Points • Nature of the relationship between the Focal points and the Quality Assessors and contractors • Are the stated outcomes clearly identifiable • Is it too soon to be able to observe the outcomes • What other positive/negative outcomes resulted from project activities that were not envisaged • Nature of relationship with other partners, e.g. including UNESCO IHE, NASA, REMPEITC, 		

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	<p>national, regional and international organisations to this project</p> <ul style="list-style-type: none"> • Were Project resources focused on the set of activities that were expected to produce significant results? • Was there any identified synergy between Project initiatives that contributed to reducing costs while supporting results? 	<p>and UCAR JOSS, WMO, Conseil general de Martinique and UNESCO-IOC</p> <ul style="list-style-type: none"> • Have there been time extensions on the project? What were the circumstances giving rise to the need for time extension? • Has there been over-expenditure or under-expenditure on the project? • What mechanisms did UNDP have in place to Monitor Implementation? Were these effective? 		
Relevance	<ul style="list-style-type: none"> • How were the outputs identified • Are the outputs/outcomes consistent with national priorities for disaster risk reduction • Are the activities consistent with national Capacities • Are the 	<ul style="list-style-type: none"> • What has transpired since the provision of training through the project and now. • Whether the various computer models developed through the project took into 	<ul style="list-style-type: none"> • Relevant project documents • Results and Resources framework • Relevant national strategies and plans • Project related documentation • Government officials, project staff at the national level and at UNDP, UNDP officials, EU and UKAID officials, civil society 	<p>One-on-one meetings</p> <p>Review of Project documents – Continuity Plans; Regional workshop reports</p> <p>Review of appropriate national documents</p> <p>Site visits, where applicable</p>

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	outcomes relevant and effective for achieving the overall national priorities, goals and impacts?	consideration the islands' capacities for using and regularly populating the models.	organisations and legislation • Policies and legislation • Project related reviews	
Sustainability	<ul style="list-style-type: none"> • Number of territories that are ready to implement the strategies identified through the project. • Does/did the project have an exit strategy? • To what extent does the exit strategy take into account the following: <ul style="list-style-type: none"> • --Political factors (support from national authorities) • --Financial factors (available budgets) • --Technical factors (skills and expertise needed) • --Environmental factors (environmental appraisal) • To what extent have partners, especially the EU and UKAID committed to providing 	<ul style="list-style-type: none"> • Whether countries have the necessary data and instrumentation required for computer modelling. • An assessment of whether training in Light Search and Rescue (SAR) for instance has resulted in funding from national budgets to purchase the necessary equipment, insurance etc. • Whether each of the 4 SAR teams trained through this project is still intact as a team • Existence of recovery and reconstruction strategies and plans at national and sectoral levels. 	Relevant project documents Results and Resources framework Relevant national strategies and plans • Project related documentation • Annual Reports • Government officials, project staff at the national level and at UNDP, UNDP officials, EU and UKAID officials, civil society organisations • Policies and legislation • Project related reviews	One-on-one meetings Review of Project documents – Continuity Plans; Regional workshop reports Review of appropriate national documents Site visits, where applicable

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	<p>continuing support?</p> <ul style="list-style-type: none"> • How will concern for gender equality, human rights and human development be taken forward by primary stakeholders? • Have countries identified allocations in their respective national budgets to continue roll out of the outputs • What issues emerged during implementation as a threat to sustainability? • What corrective measures were adopted? • How has UNDP addressed the challenge of building national capacity in the face of high turnover of government officials? • How has UNDP approached the scaling up of successful pilot initiatives and catalytic projects? Has the government taken on these initiatives? Have donors stepped 	<ul style="list-style-type: none"> • Existence of risk reduction strategies and plans at national and sectoral levels with a cadre of trained national and community personnel, with networking systems • Number of training activities completed to improve local capacities • Type of hardware and software provided to compliment improved capacities through training • Risks and challenges that the project faces or foresees • National budgetary allocations for 2013/2014 for DRM • What unanticipated sustainability threats emerged during implementation? • What 		

Criteria/sub criteria	Questions to be addressed by outcome evaluation	What to look for	Data Sources	Data Collection methods
	in to scale up initiatives?	corrective measures did UNDP take?		

APPENDIX 5

List of Stakeholders Interviewed

Type of Stakeholders	Role and Type of relationship	Name and Position
PRIMARY		
	CO-Chair of Project Board	Ms Maria Dijkhoff-Pita Territorial Authorizing Officer (TAO), Aruba
	EU Representative on Project Board	Mr by Anthony Robert Former Head of Infrastructure, European Delegation for Barbados and the OECS
	Project Board member	Mr Roger Bellers Disaster Risk Reduction Advisor, Caribbean OTs, UKAID (DFID) Caribbean
	R3i Focal Point	Ms Melissa Meade Director, Department of Disaster Management (DDM), Anguilla
		Mr Jaime Donata Director, Crisis Management Office, Aruba
		Ms Nereida Gonzalez Island Secretary, Bonaire
		Ms Sharleen DaBreo Director, Department of Disaster Management (DDM), BVI
		Mr McCleary Frederick Director, Hazard Management Cayman Islands (HMCI), Cayman Islands
		Mr Elvin Regina

Type of Stakeholders	Role and Type of relationship	Name and Position
		Disaster Manager/Fire Chief, Brandweer, Curacao
		Mr Billy Darroux Director, Disaster Management Coordination Agency (DMCA), Montserrat
		Mr Menno van der Velde Island Secretary, Saba
		Mr Jan Helmond (represented by Mr Andre Bennett, Fire Chief) Island Secretary, Sint Eustatius
		Mr Paul Martens Head, Section Disaster Management, Brandweer, Sint Maarten
		Ms Allison Gordon Interim Director, Department of Disaster Management and Emergencies (DDME), TCI
	UNDP R3I team	Mr Ian King Programme Manager, Disaster Risk Reduction, UNDP
		Mr Alexandre Vacher R3I Project Coordinator, UNDP
		Ms Danielle Evanson R3I Project Officer, UNDP
SECONDARY		
Secondary Stakeholders	Oversight of disaster management	Dr Virginia Clerveaux Deputy Secretary, Ministry of Government Support Services, TCI

Type of Stakeholders	Role and Type of relationship	Name and Position
	Expertise: early warning systems	Mr Damian Barker Communications Officer, DDM, Anguilla
	GIS expertise Spanish translation support	Ms Garymar Rivera Senior Technical Planning Manager, DDM, BVI
	Expertise: emergency telecommunications	Mr Dale Lake Communications Officer, DDM, BVI
	Expertise: emergency telecommunications	Mr Dale Lake Communications Officer, DDM, BVI
	Expertise: emergency telecommunications	Mr Lee Madison Deputy Director of Operations, HMCI, Cayman Islands
Contractors and Key Experts		
	Consultant/Team Leader: flood modelling and mapping	Prof Zoran Vojinovic UNESCO-IHE
	Expertise: early warning systems and telecommunication	Mr Art Botterell Consultant
	Expertise: geological hazards	Dr James Joyce University of Puerto Rico
	Expertise: coastal hazards modelling	Dr Aurelio Mercado University of Puerto Rico
	Director, Coastal Hazards Centre, University of Puerto Rico	Prof Aurelio Mercado-Irizarry
	Consultant/Team Leader: GIS, hazard mapping and vulnerability assessment	Ms Silvia Grava GESP
	Consultant: GIS, HM and VA	

Type of Stakeholders	Role and Type of relationship	Name and Position
	Baastel Ltée/ASI Consultant/Team Leader: EWS (Lot 1)	Ms Kathleen Imhoff

APPENDIX 6
SIGNED CODE OF CONDUCT

Annex 2: United Nations Evaluation Group Code of Conduct for Evaluation in the UN System Evaluation Consultants Agreement Form

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: _____ VASANTHA CHASE

Name of Consultancy Organisation (where relevant): _AGRICO AND ASSOCIATES

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.



Signed at Saint Lucia on November 19 2012

(Each UNEG member to create its own forms for signature)

Annex 2: United Nations Evaluation Group Code of Conduct for Evaluation in the UN System

Evaluation Consultants Agreement Form

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: _____

Name of Consultancy Organisation (where relevant): Robert Glass
Robert Management Consulting Inc.

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) Brantford, Ontario, Canada
Nov 15, 2012

Signature: _____

Annex 2: United Nations Evaluation Group Code of Conduct for Evaluation in the UN System

Evaluation Consultants Agreement Form

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Paul H. SANDERS

Name of Consultancy Organisation (where relevant): AGRICO AND ASSOCIATES

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date)

Signature: 

**Annex 2: United Nations Evaluation Group Code of Conduct
for Evaluation in the UN System
Evaluation Consultants Agreement Form**

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

**Agreement to abide by the Code of Conduct for Evaluation in the UN
System**

Name of Consultant: Elisabeth Charles-Soomer

Name of Consultancy Organisation (where relevant): AGRICO AND ASSOCIATES

I confirm that I have received and understood and will abide by the United Nations Code of
Conduct for Evaluation.

Signed at (place) on (date)



ST. Lucia 19 Nov. 2012.

Annex 2: United Nations Evaluation Group Code of Conduct for Evaluation in the UN System

Evaluation Consultants Agreement Form

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Manuela Luvette Thomas-Louisy

Name of Consultancy Organisation (where relevant): AGRICO AND ASSOCIATES

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

A handwritten signature in dark ink on a light yellow background. The signature is stylized, starting with a large 'M' and ending with a long horizontal stroke.

Signed: at Castries, Saint Lucia, on November 21, 2012

APPENDIX 7
2012 B-TOOL ASSESSMENTS

B-TOOL ASSESSMENT REPORTS

2012

1.0 INTRODUCTION

The Vulnerability Benchmarking Tool (B-Tool) was developed by USAID and the OECS Secretariat to improve the ability of national governments, civil society organisations, and the private sector to proactively plan and implement effective and efficient actions that would reduce their vulnerability to natural disasters and create greater economic resilience when they do occur. It aims to:

- Evaluate the adequacy of national economic and disaster risk infrastructure management tools
- Evaluate the readiness and capability of national institutions to proactively reduce the country's risk to natural disasters and to respond effectively in the aftermath
- Outline good practices for mainstreaming disaster risk management into development planning

The B-Tool is designed as a nationally-administered tool. In terms of risk exposure, it was designed for multi-hazards with the scope to rework it for a particular hazard. In geographic extent, it could be redesigned for use at community, or enterprise levels. It is, however, customisable to meet specific dimensions. In its present form, it covers all the vulnerable elements in general but may be redesigned to focus on any one of the following vulnerable elements: affected population, infrastructure, economy, and environment. Use of the B-Tool at the national level can:

- provide a snapshot of a country's exposure to natural disaster
- be used to build support for the allocation of resources to reduce risk in areas defined by the B-Tool
- help prioritise national and regional programmes of activities
- be employed as an incentive at the political level to stimulate action to address areas of relative weakness
- generate consistent information on the state of readiness of each country; which can further be used by regional and international funding agencies to define or redefine programmes of assistance to the region
- deliver information on the improvement of national systems by comparing annual results

The R3i used the B-Tool in 2010 to gather baseline data from the participating Dutch and UK OCTs. That baseline data was used to validate the design of the project and to determine how each of the project outputs would respond to the capacities, priorities and needs of each of the participating countries. The purpose of the second assessment that was undertaken in 2012 was to ascertain whether changes had occurred to each participating country's risk identification and disaster preparedness indices¹⁵ as a result of project activities. This second assessment is part of the project evaluation. A discussion of the differences in the indices between 2010 and 2012 is available in the main Evaluation Report (Chapter 4).

¹⁵ Using these risk management indices (RMI), the country is able to identify the adequacy of its risk management initiatives, identify gaps, overlaps, omissions, as well as strengths and successes. The indices may be used to select and prioritise projects and programmes that will help to improve its future rankings.

The 2010 B-Tool Assessments were undertaken in all the OCTS: Anguilla, Aruba, Bonaire, Cayman Islands, Curaçao, Montserrat, Saba, Sint Eustatius, Sint Maarten, Turks and Caicos Islands, and the Virgin Islands. The 2012 Assessment did not include Bonaire, St. Eustatius and Saba¹⁶. Furthermore, a number of the persons who had participated in the initial 2010 assessment were no longer available to participate in the 2012 assessment.

2.0 COUNTRY ASSESSMENTS

The general description of the country background; socio-economic characteristics; hazard vulnerability and institutional arrangements for disaster management articulated quite eloquently in the 2010 reports remain the same and are thus referenced here. In addition, while the 2010 assessment included all 6 phases in comprehensive disaster management; the 2012 evaluation included only 2 phases; i.e. risk identification and disaster preparedness.

For ease of reference, the description of how the B-Tool is used to calculate the Total Disaster Risk Management Index and each of its components is reproduced here.

Each of the phases under consideration is subdivided into components and each component has a series of questions. For each of the questions there are four optional responses are “yes”; “qualified yes”; “planned”; and “no”.

A score of three (3) would be assigned for a “yes” response, two (2) for “qualified yes” response ; one (1) for “planned” response and zero (0) to a ‘no” response.

Response	Description	Score to be awarded
Yes	Means that the country has an absolute positive response to the question posed	3
Qualified Yes	Means the country has a conditional positive response and therefore the condition that prevented an absolute response should be clearly stated in the comments column e.g. outdated laws; inadequate funding	2
PLANNED	Means the country has initiated action towards providing a positive response within the next 2 years. In the comments column, a statement on the status of the plan should be provided	1
No	Means the country has a negative response to the question posed	0

As is prescribed in the B-Tool methodology, a two step approach was used to rate a country’s risk identification and disaster preparedness efforts. In the first steps the risk

¹⁶ During the course of the project, these three territories had become municipalities of the Kingdom of the Netherlands and there was much unsurity as to whether they could participate in the project.

management index (RMI) for each of the two components of Comprehensive Disaster Risk Management (CDRM) was calculated. In the second step, the Total Disaster Risk Management index of the country was computed.

Calculating the RMI for each component of comprehensive disaster risk management uses the following formula, where TS is the total score obtained in the section and MAS is the maximum attainable score:

$$RMI_i = TS_i / MAS_i$$

The Total Disaster Risk Management Index (TDRMI) of a country is the average of its score in each of the six components of comprehensive disaster risk management (CDRM). This is computed as:

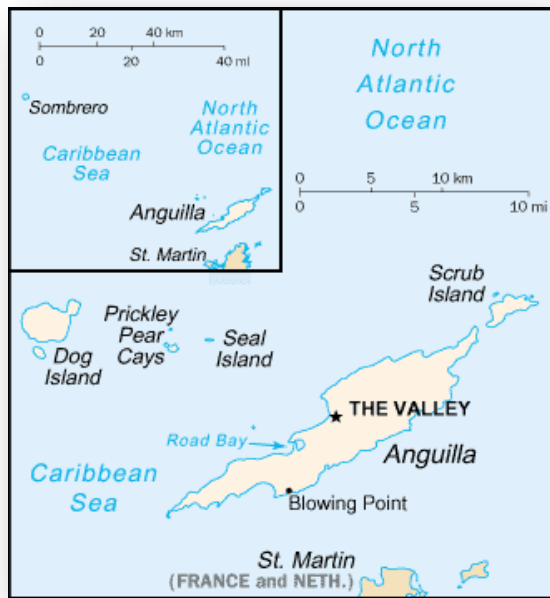
$$TDRMI = \Sigma[RMI_{RI}, RMI_{RM}, RMI_{RT}, RMI_{DP}, RMI_{ER}, RMI_{RR}] \div 6$$

The meaning of these scores in relation to the effectiveness of national capacities is evaluated in relation to the performance scale below:

Score	Performance rating
80% and above	Excellent
65% - 79%	Very good
50% - 64%	Good
35% - 49%	Average
Less than 35%	Below average

Described in the following sections are the analyses of capacities within OCTS – only 8 in this instance - in 2 aspects of disaster management (risk identification and Disaster Preparedness) based on the information gathered, and the respective scores calculated from the B-Tool assessment

As already explained in the main report, Chapter 4, there are very significant changes in the indices between 2010 and 2012. It is very difficult to ascertain whether the R3i had such an impact to account for some of the very significant shifts upwards between 2010 and 2012. In the case of the BVI, for instance, evidence was provided to show that financing of a number of the activities especially in risk identification was through nationally allocated budgets. It cannot be discounted however that the R3i has introduced significant awareness of disaster management; capacities for disaster management across a number of national agencies have also improved. This increased awareness and sensitisation could also have impacted on the responses received in 2012.



2.1 ANGUILLA

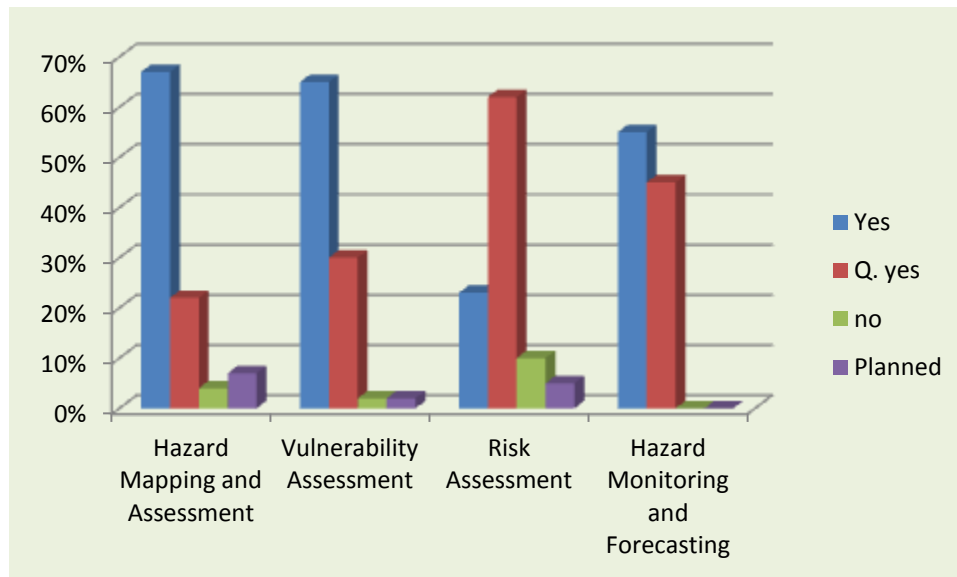
Described in the following sections are the analyses of capacities within Anguilla in risk identification and disaster preparedness based on the information gathered, and the respective scores calculated from the B-Tool assessment.

Table 1 and Figure 1 represent the findings for risk identification.

Table 1: Risk Identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{RI} (%) 2012
Hazard Mapping and Assessment	36	6	3	1	2	26	108	
Vulnerability Assessment	26	10	7	1	1	45	78	
Risk Assessment	22	3	12	4	2	35	66	
Hazard Monitoring and Forecasting	22	9	11	0	0	49	66	
TOTAL QUESTIONS	106	28	33	6	5	161	318	48%

Figure 1: Percentage scoring for individual components in risk identification



The **RMI_{RI}** in 2012 is 48% or a performance rating of “*average*”. A 6 percentage point increase is noted between the 2010 and 2012 indices.

The 2010 Assessment reported that whereas only about 35% of the responses for hazard mapping and assessment were positive (yes/qualified yes), planned activities in this area received a 50% score. The Assessment Report noted that this was an indication that this area should receive a higher score once the requisite resources (technical/financial) are put in place. In 2012, the “yes” responses had increased to about 67% while the “*qualified yes*” responses were 22%; “planned” activities received a score of only 7%.

In terms of vulnerability assessments, based on the 2010 scores, 50% of the responses to questions on vulnerability assessments were a “qualified yes”; only 4% of the responses were, “yes”. In 2012, the “yes” responses have increased to over 60% and responses to the, “qualified yes” had declined to the cusp of 30%. It is to be noted that through the R3i Anguilla received GIS technical assistance and training. Most importantly a LiDAR aerial survey has been completed for the entire island. A geodetic survey was also conducted, and a new reference network established. Data have been used to produce a high resolution terrain model (3D with buildings), orthophotography and GIS layers. The data produced will be used by Anguilla to produce flood hazard maps and models, select warning areas, conduct hazard, risk and vulnerability assessments, and provide a damage assessment baseline.

Increases were also observed to responses to questions on risk assessment. In 2010, 41% of the responses were “No”, while another 27% were “Planned”. In 2012, 21% of the responses were “yes” and another 60% were a “qualified yes”. In general the RMI for risk assessment is still average at 38%. One of the challenges that was reported in 2010 and

still remains in 2012 is the absence of appropriate regulations to support vulnerability assessments.

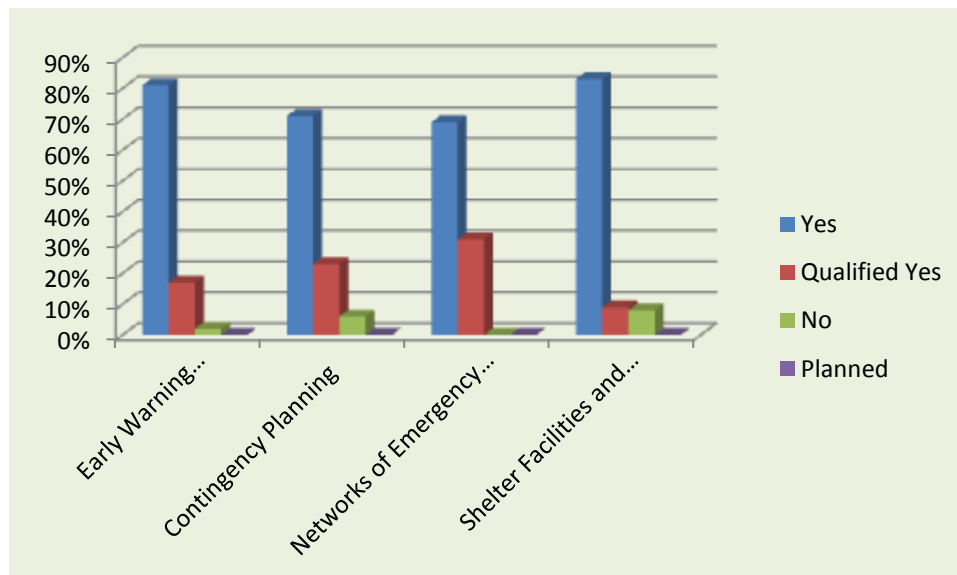
In 2010 the Hazard monitoring and forecasting component had a very high negative response with a over 50% “no” responses. In 2012, 55% of the responses were, “yes”, while the remaining 55% were, “qualified yes”. The RMI for this component in 2012 was 74%.

Table 2 and Figure 2 represent the summary findings for disaster management

Table 2: Disaster preparedness

DISASTER PREPAREDNESS: 2012	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	45	13	4	1	0	47	135	
Contingency Planning	35	19	9	5	0	83	105	
Networks of Emergency Responders	14	6	4	0	0	28	42	
Shelter Facilities and Evacuation Plans	27	18	3	5	0	69	81	
TOTAL QUESTIONS	121	56	20	11	0	218	363	61%

Figure 2: Percentage scoring for individual components in disaster preparedness





The **RMI_{DP}** in 2012 for Anguilla is 61% or a performance rating of “*good*”. In terms of the components of risk identification Anguilla received high scores for early warning and communication systems, shelter facilities and evacuation plans. Lowest scores were reported for networks of emergency responders. Nevertheless every component received scores of more than 65%.

Flooding in Anguilla on November 27 2011

Source: <http://www.al-hcs.com>

The scores for early warning and communications systems had increased quite dramatically from about 62% in 2010 to 82% in 2012. Similarly the responses for shelter facilities and evacuation plans had risen from 85% in 2010 to 90% in 2012. There was however a decline of about 16 percentage points in the scores for networks of emergency responders between 2010 and 2012. The higher score for this component resulted in the the **RMI_{DP}** in 2010 being 74% with a rating of “*very good*”.



2.2 ARUBA

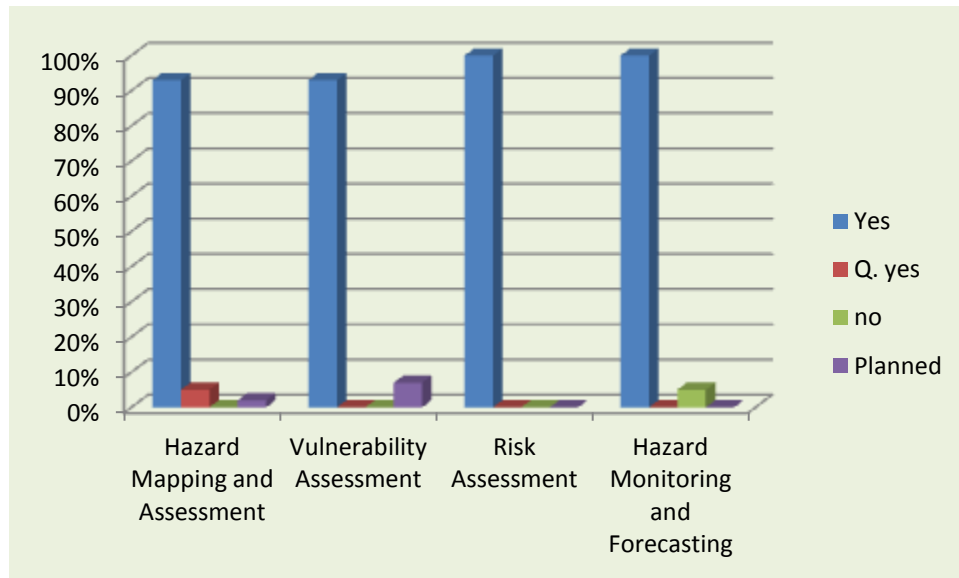
Described in the following sections are the analyses of capacities within Aruba in risk identification and disaster preparedness based on the information gathered, and the respective scores calculated from the B-Tool assessment.

Table 3 and Figure 3 represent the summary findings for disaster management

Table 3: Risk identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{RI} (%) 2012
Hazard Mapping and Assessment	36	25	2	6	2	87	108	
Vulnerability Assessment	26	19	0	3	4	64	78	
Risk Assessment	22	20	0	2	0	62	66	
Hazard Monitoring and Forecasting	22	19	0	3	0	60	66	
TOTAL QUESTIONS	106	83	2	14	6	273	318	81%

Figure 3: Percentage scoring for individual components in risk identification



The **RMI_{RI}** for 2012 was 81% compared to 61% in 2010. Hazard mapping and Assessment is well covered with 86% of the responses being, “yes” and 5% being a, “qualified yes”. The hazard maps depict the location and magnitude of hazards, and also show vulnerable human settlements and vulnerable social infrastructure. Just as in 2010, the maps are still not available to the general public.

In 2012, the score for vulnerability assessments also increased by about 21%. Eighty-six per cent of the responses to the questions in this component were, “yes”.

The scores for risk assessment and hazard monitoring and forecasting increased substantially in 2012. Ninety-six per cent of the responses for risk assessment were, “yes”. Risk assessments are now community specific; they are conducted and revised on a regular basis; and rely on vulnerability assessments and hazard mapping.

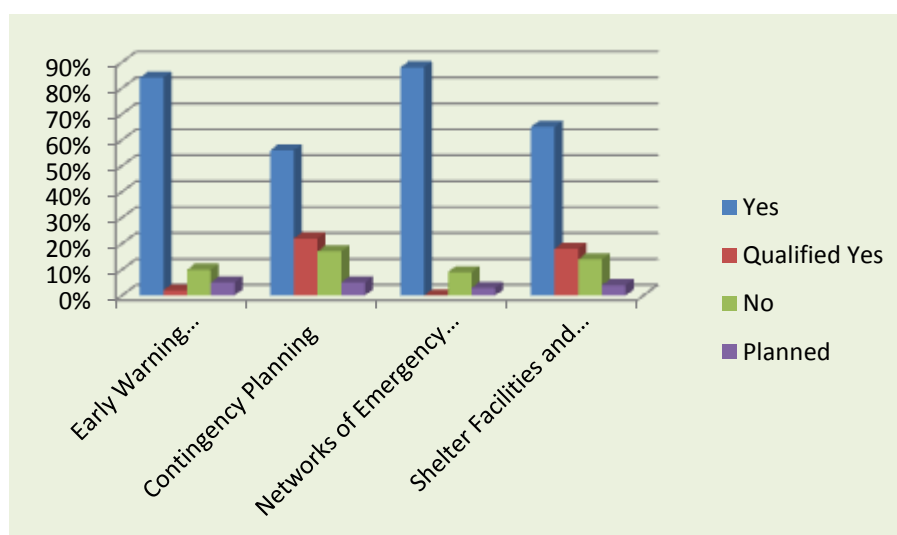
Hazard monitoring and forecasting are also well covered in 2012 as it was in 2010. Ninety-five per cent of the responses were, “yes” in 2012. Local Communities are, however, not actively involved in hazard monitoring and forecasting. Some monitoring material such as radar and GTS data comes from Curacao via the internet, whilst information to forecast the behaviour of natural hazards comes through the International Federation of Red Cross and Red Crescent Societies (IFRC) disaster management system. There is no active system to assess whether there are any activities likely to increase disaster risks in communities.

Table 4 and Figure 4 represent the findings for disaster preparedness.

Table 4: Disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
DISASTER PREPAREDNESS: 2012								
Early Warning and Communications Systems	45	29	1	10	5	104	135	
Contingency Planning	35	12	7	11	3	64	105	
Networks of Emergency Responders	14	10	0	3	1	34	42	
Shelter Facilities and Evacuation Plans	27	9	5	8	2	57	81	
TOTAL QUESTIONS	121	60	13	32	11	259	363	63%

Figure 4: Percentage scoring for individual components in disaster preparedness



The **RMI_{DP}** for 2012 is 71 % or a performance rating of “very good”. The performance rating in 2010 was, “good” with a score of 57%. The 2010 assessment noted that there was still substantial room to strengthen what is in place, notably in the sub-area of early warning and communications systems.

In 2012, the RMI for early warning and communication systems had increased to 61% with the scores for the “yes” response rising from 18% in 2010 to 93 % in 2012. Similarly too the “yes” scores for network of emergency responders increased from about 58% to 97%. Aruba received substantial assistance from R3i in developing its capacity for early warning systems. It is a member of the 4 multi-country, multi-hazards CAP alerting system.



2.3 CAYMAN ISLANDS

Described in the following sections are the analyses of capacities within Cayman Islands in risk identification and

disaster preparedness based on the information gathered, and the respective scores calculated from the B-Tool assessment.

Table 5: Risk identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI_{RI} (%) 2012
Hazard Mapping and Assessment	36	39	18	0	4	61	108	
Vulnerability Assessment	26	36	12	0	3	51	78	
Risk Assessment	22	36	2	0	4	42	66	
Hazard Monitoring and Forecasting	22	51	6	0	0	57	66	
TOTAL QUESTIONS	106	162	38	0	11	211	318	66%

The **RMI_{RI}** for 2012 was 66% compared to the 43% in 2010. The performance rating moved from “average” in 2010 to “good” in 2012. Components of risk identification showed significant progress with all of them scoring more than 60% responses for the “yes” responses. In all instances the “yes” responses had increased by more than double.

Figure 5: Percentage scoring for individual components for risk identification

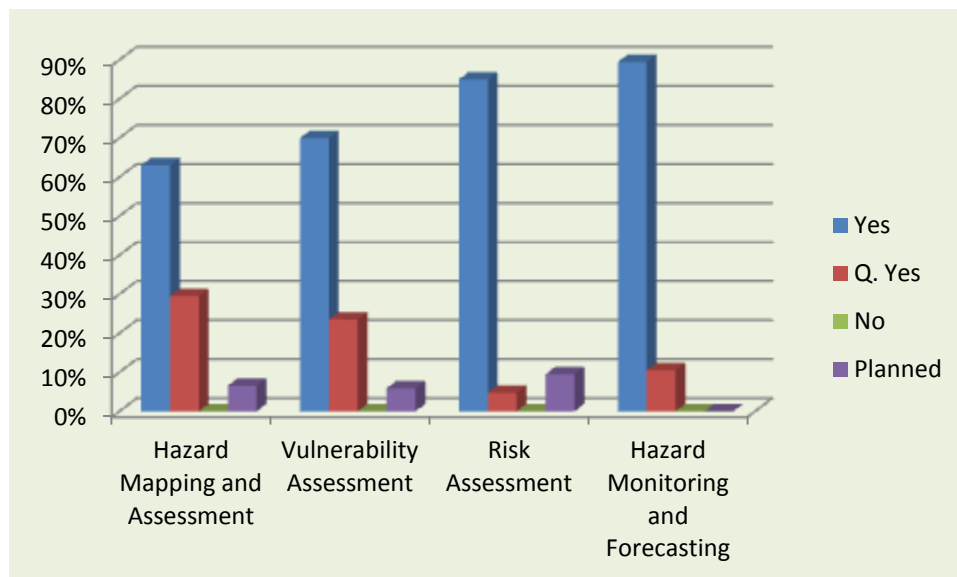
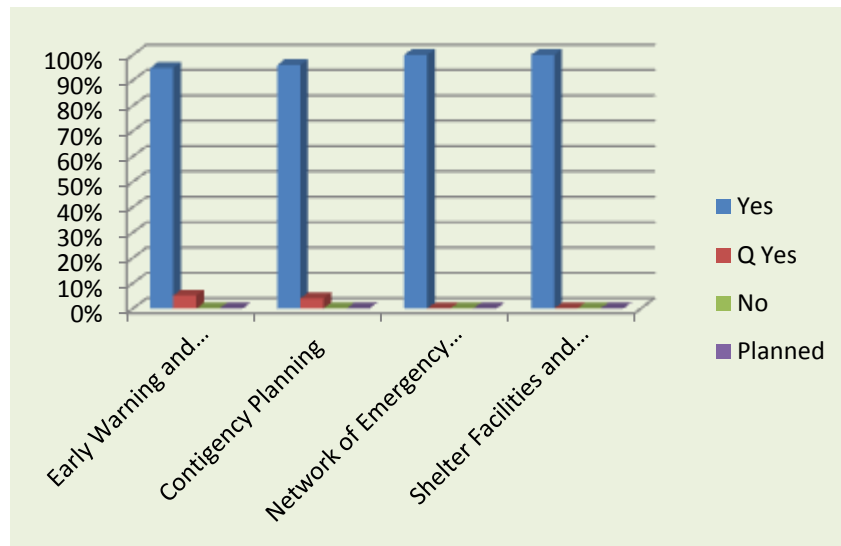


Table 6: Disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	44	37	3	4	0	117	132	
Contingency Planning Networks of Emergency Responders	35	32	2	1	0	100	105	
Shelter Facilities and Evacuation Plans	14	14	0	0	0	42	42	
TOTAL QUESTIONS	26	21	0	5	0	63	78	
	119	104	5	10	0	322	357	90%

The **RMI_{DP}** for 2012 was calculated to be 90%, a substantial increase of 63% more than what was reported in 2010. Significant increases in scores for all of the components were recorded for 2012: all components received at least 90% “yes” responses.

Figure 6: Percentage scoring of individual components for disaster preparedness





2.4 CURAÇAO

Described in the following sections are the analyses of capacities within Curaçao in risk identification and disaster preparedness based on the

information gathered, and the respective scores calculated from the B-Tool assessment.



An oil spill on August 29 2012

"Images of the island's southern Jan Kok area showed a darkened coast and gobs of oil dripping off coastline rocks and mixing in the surf. Oil-daubed flamingos, crustaceans, and lizards could be seen struggling on the wind-swept reserve of salt flats."

Source:

<http://www.caribbean360.com/index.php/news/curacao-news/610216.html#ixzz2GSUVT6Yz>

Table7: Risk identification

	SCORES						
	Yes	Q. Yes	No	Planned	Total Scores	Maximum Score	RMI _{RI}
Hazard Mapping and Assessment	27	4	0	11	42	108	
Vulnerability Assessment	0	6	0	9	15	78	
Risk Assessment	6	0	0	8	14	66	
Hazard Monitoring and Forecasting	48	6	0	3	57	66	
Total Points	81	16	0	31	128	318	40%

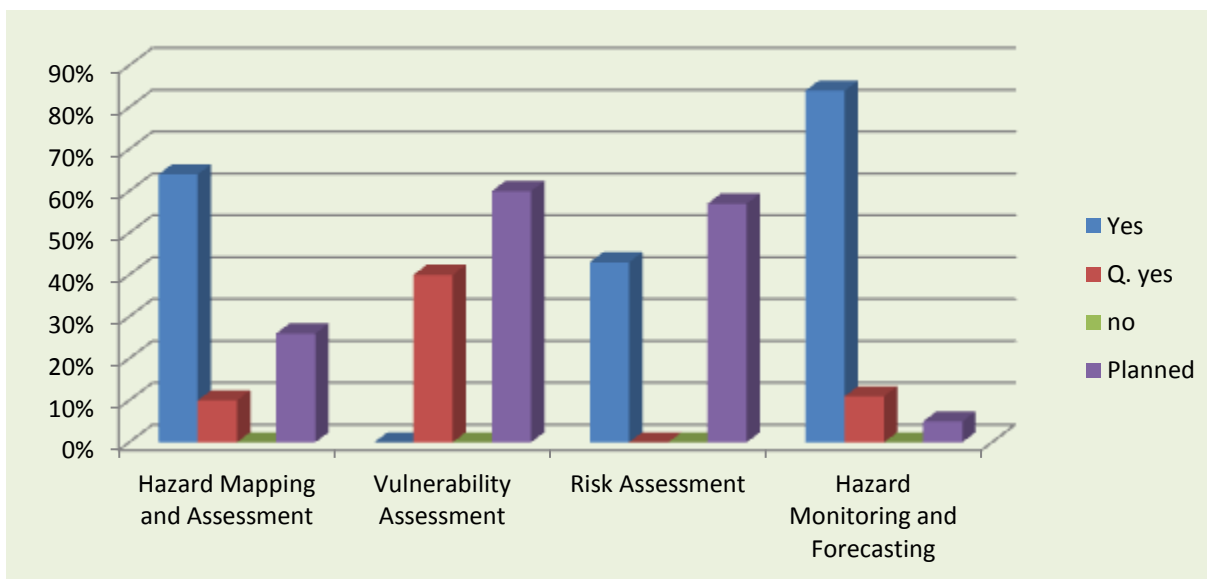
As is observed in Table 7 below, The RMI_{RI} for 2012 was 40%. In 2010, the RMI_{RI} was 77%, implying a drop in the performance rating from “very good” to “average”. Although the RMI had dropped, the percentage scoring for the individual components have increased for all except for the “yes” responses for vulnerability assessments where a zero was recorded.

The 2012 Assessment recorded that no hazard mapping was undertaken. In 2010, however the Assessment states that mapping has been done for storm surges and wind hazards up to Category 2 hurricane strength (96-110 mph winds). Under the legislation, all disasters which are likely to have an impact must be mapped and a contingency plan with built in scenarios developed to mitigate this.

The 2010 Assessment also states that mapping has also been undertaken for flood and other high risk areas (e.g. the area around the boundary of the refinery). Sector 1, which is located on the South Coast, has been mapped and scenarios developed. The tropical storm vulnerability study of the south coast is made accessible to all developers. However, as building codes are not legally mandated, it is difficult to know whether recommendations based on this study are taken into consideration during the construction process.

The results of hazard mapping and assessment exercises, with location and magnitude of events, are available to stakeholders and shared, especially when requested by developers.

Figure 7: Percentage scoring of individual components for risk identification



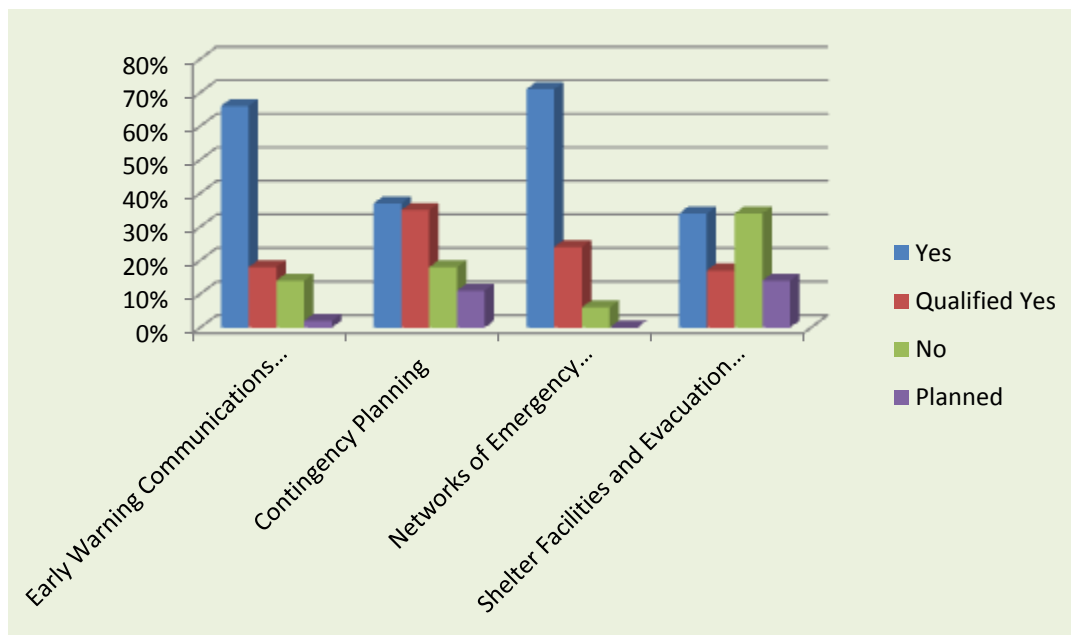
The scores for disaster preparedness are provided in table 8 and figure 8.

Table 8: disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	45	19	8	12	2	87	135	
Contingency Planning	35	7	10	10	6	57	105	
Networks of Emergency Responders	14	8	4	2	0	34	42	
Shelter Facilities and Evacuation Plans	27	4	3	12	5	35	81	
TOTAL QUESTIONS	121	38	25	36	13	213	363	57%

The **RMI_{DP}** has dropped from 60% in 2010 to 57% in 2012. Nevertheless, early warning and communications systems together with networks for emergency responders received a, “good” and, “very good” rating respectively. Contingency planning remained the same for both years, as was shelter facilities and evacuation plans.

Figure 8: Percentage scoring of individual components for disaster preparedness



The respondents to the B-Tool Assessment in 2012 reported that there is no plan for the development of warning systems that is agreed to by subject experts and relevant authorities. Yet in 2010 the Assessment reported that early warning systems are installed for the main hazards to the country, namely tropical cyclones, severe weather phenomena and tsunamis. Potential technological hazards are, however, not fully covered.

Monitoring systems use radar and satellite equipment and are adapted to local conditions.

As was also indicated in 2010, early warning data are available from Venezuela and the Pacific Tsunami Warning Centre (PTWC). The NHC/NOAA provides scientific expertise to interpret data on natural hazards, whilst the MDNAA manages and stores the data. Internet, SMS and email are used to provide near real time data management. Personnel are available on a 24-hour basis and generators are available to provide power backup.

The status for contingency plans remains the same as 2010. It was just a little over 30% for the “yes” and “qualified yes” responses in 2012. There are contingency plans in place but not at all levels, or for all prevalent hazards. There is no legal mandate for the development of contingency plans. However there is a legal mandate for the DMO (Ordinance PB 2002 #46) to address specific areas and disasters (e.g. the airport, harbour, refinery, oil spills, terrorism, flu epidemic).

There are fairly well established networks of first responders. The 2012 Assessment scored this component with a, “*good*” performance rating. In 2010, the “yes” responses were less than 60%.

Curaçao received shelter management training through R3i. The 2012 assessment reported that the country will now be formulating the necessary policies and plans. The Red Cross assists with shelter management.

According to the 2012 assessment there is a national emergency evacuation plan for coastal areas but there are no clearly defined evacuation routes or signs. The shelter facilities and evacuation plans component in the 2012 assessment received a RMI of 43% or a performance ranking of, “*average*”.



2.5 MONTSERRAT

Described in the following sections are the analyses of capacities within Montserrat in risk identification and disaster preparedness based on the information gathered, and the respective scores calculated from the B-Tool assessment.

Table 9 and Figure 9 assess risk identification while table 10 and Figure 10 assess disaster

preparedness.

Table 9: Risk identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI_{RI} (%) 2012
Hazard Mapping and Assessment	36	7	15	8	4	63	108	
Vulnerability Assessment	26	10	8	4	1	51	78	
Risk Assessment	22	11	5	4	1	58	66	
Hazard Monitoring and Forecasting	22	15	2	5	0	22	66	
TOTAL QUESTIONS	106	43	30	21	6	194	318	61%

In 2010 the **RMI_{RI}** was reported as 80% and received, “excellent” as the performance rating. In 2012, the **RMI_{RI}** is reported as 61% with a performance rating of, “good”. One reason could be the decline in the number of, “yes” responses to hazard mapping from 22 in 2010 to only 7 in 2012. There were increases in the “yes” responses for all the other components.

Figure 9: Percentage scoring of individual components for risk identification

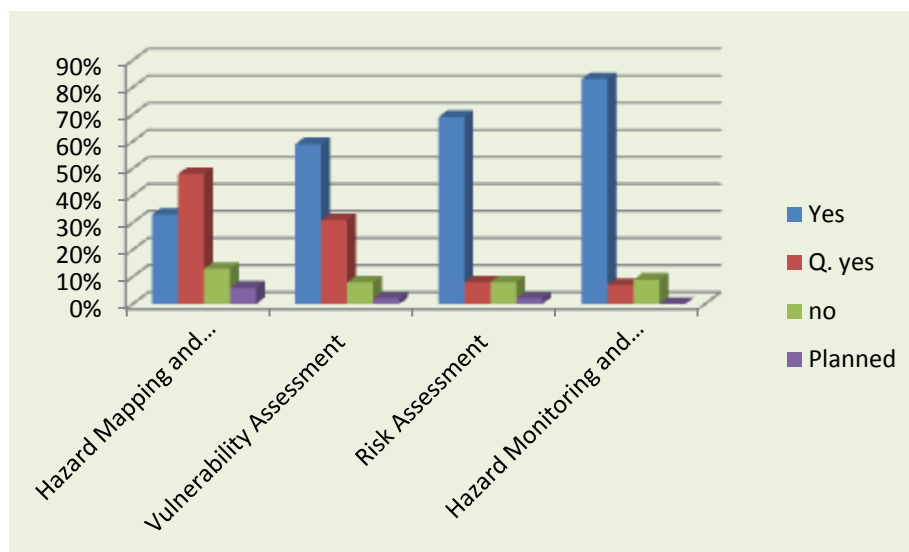
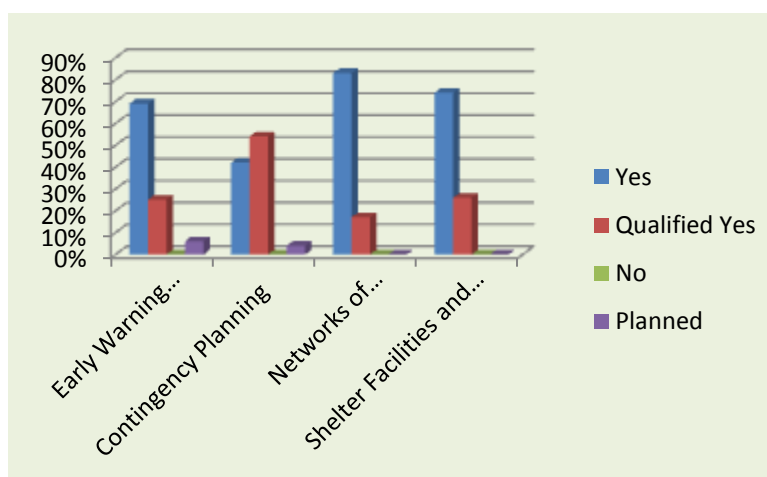


Table 10: Disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	45	22	12	6	5	101	135	
Contingency Planning	35	10	19	2	3	73	105	
Networks of Emergency Responders	14	10	3	1	0	37	42	
Shelter Facilities and Evacuation Plans	27	15	8	1	0	62	81	
TOTAL QUESTIONS	121	57	42	10	8	273	363	75%

Figure 10: Percentage scoring of individual components for disaster preparedness



The **RMI_{DP}** in 2012 was 75% as compared to 64% in 2010. Thus the performance rating had shifted from, “good” to, “very good”. The “yes” responses for early warning and communication systems had increased, quite substantially from just over 40% to just over 60%. The percentage of “yes” has also increased for networks for emergency responders and for shelter facilities and evacuation plans. While it is still too early to make definitive statements, it should be noted that Montserrat benefitted from training and equipment for upgrading its early warning and communication systems capacities that were provided by R3i.



Source: Disaster Management Capacity Assessment Report, 2010



2.6 SINT MAARTEN

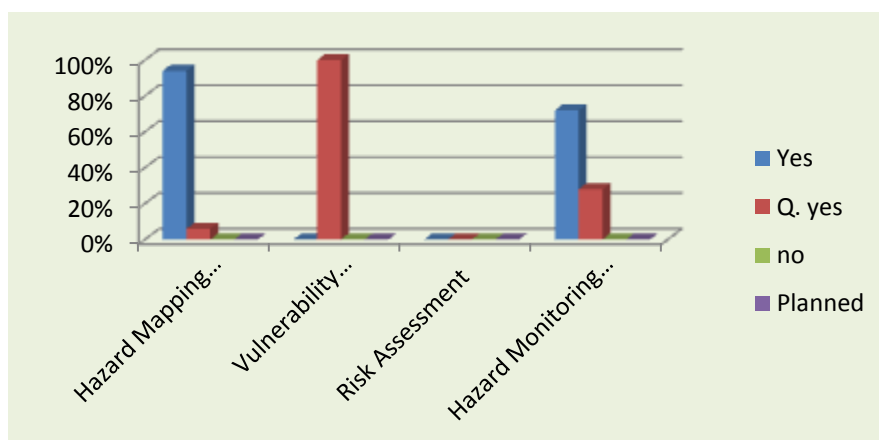
Described in the following sections are the analyses of capacities within Sint Maarten in risk identification and disaster preparedness based on the

information gathered, and the respective scores calculated from the B-Tool assessment.

Table 11: Risk identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{RI} (%) 2012
Hazard Mapping and Assessment	36	22	2	10	0	80	108	
Vulnerability Assessment	26	0	1	14	0	16	78	
Risk Assessment	22	0	0	22	0	22	66	
Hazard Monitoring and Forecasting	22	14	5	3	0	61	66	
TOTAL QUESTIONS	106	36	8	49	0	179	318	56%

Figure 11: Percentage scoring of individual components for risk identification





Wind and water damage by Hurricane Lenny near the salt pond, 1999

Source:
<http://www.meteo.an/Include/Climate2/documents/HurricanesandTropicalStorms.pdf>

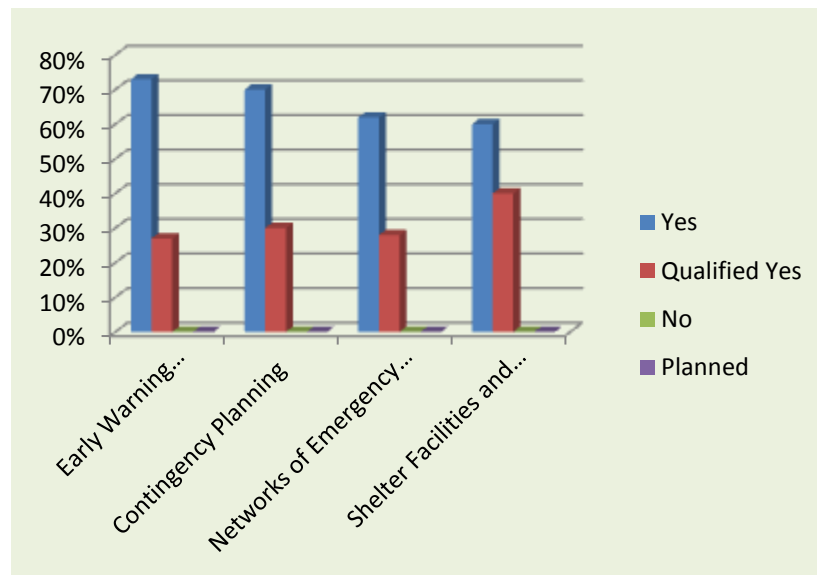
With reference to Table 11 and Figure 11, the **RMI_{RI}** for 2012 was recorded as 56%, compared to the 34% that was recorded in 2012. It is still too early to determine whether the positive change in this index is a result of R3i. It should however be noted that Sint Maarten did benefit substantially from Output 1 of the project. The country now has inland and coastal models and maps; it also benefitted from substantial capacity strengthening for hazard analysis and GIS capabilities, including the provision of hand held GPS for mapping critical infrastructure on flood overlays.

Vulnerability assessments still appear to be problematic. In 2010, less than 5% of the responses were, “yes”; close to 15% were; “qualified yes”. In 2012, 88% of the responses to the questions on vulnerability assessment were “no”. In 2010 too this component received the highest number of “no” as responses.

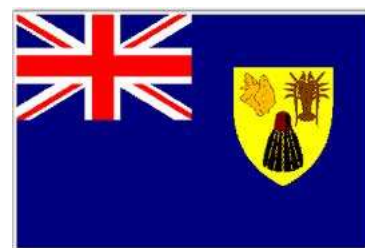
Table 12: Disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	45	69	26	0	0	95	135
Contingency Planning	35	42	18	0	0	60	105
Networks of Emergency Responders	14	21	8	0	0	29	42
Shelter Facilities and Evacuation Plans	27	21	14	0	0	35	81
TOTAL QUESTIONS	121	153	66	0	0	219	363 60%

Figure 12: Percentage scoring of individual components for disaster preparedness



The RMI_{DP} was reported as 60% in 2012; in 2010 it was 57%. The performance rating therefore has not changed. Be that as it may, the “yes” responses for early warning and communication systems declined from 61% in 2010 to 51% in 2012. The “yes” responses for contingency planning also dropped from 57% in 2010 to 44% in 2012. Similarly the very good performance rating (69%) for networks of emergency responders dropped to a performance rating of good (50%).



2.7 TURKS AND CAICOS

Described in the following sections are the analyses of capacities within Turks and Caicos in risk identification and disaster preparedness based on the information gathered, and the

respective scores calculated from the B-Tool assessment. Unlike the other islands, the B-Tool was self administered by personnel in TCL. In addition the Head of Disaster Management was not available when the Tool was administered in 2012.

Table 13: Risk Identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{RI} (%) 2012
Hazard Mapping and Assessment	36	21	10	0	5	36	108	
Vulnerability Assessment	26	39	4	0	6	49	78	
Risk Assessment	22	0	0	0	0	0	66	
Hazard Monitoring and Forecasting	22	0	0	0	0	0	66	
TOTAL QUESTIONS	106					85	318	27%

The **RMI_{RI}** in 2012 is 27%; recording a 50 % decrease since 2010. This decrease must, however, be treated guardedly because none of the questions for risk assessment and hazard monitoring and forecasting were responded to. The “yes” responses for hazard mapping and vulnerability assessment were 58% and 80% respectively.

Figure 13: Percentage scoring of individual components for disaster preparedness

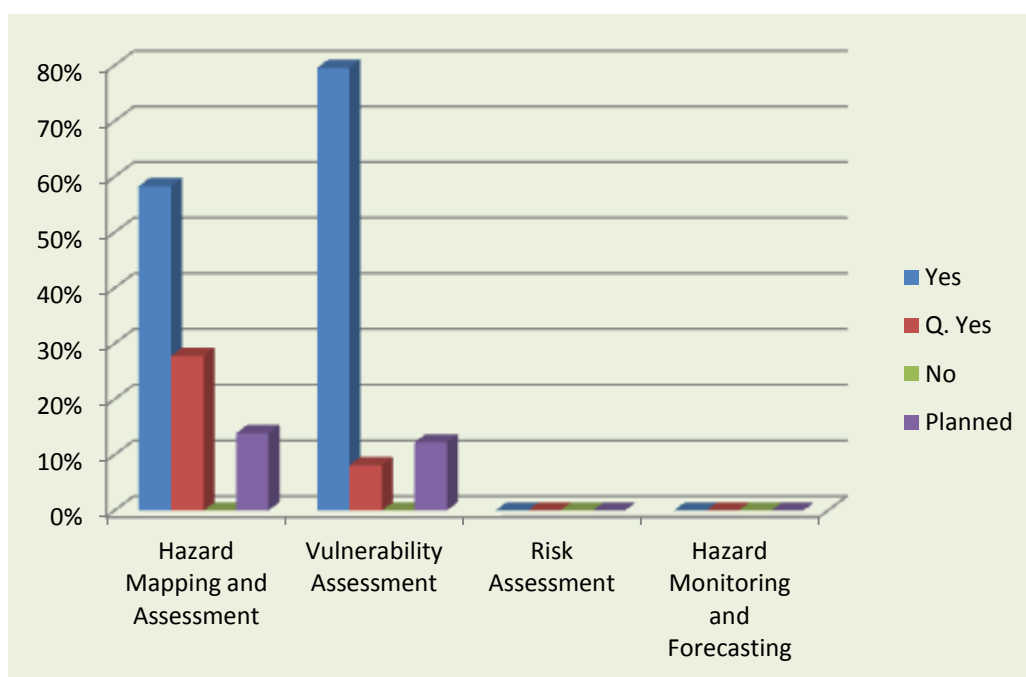
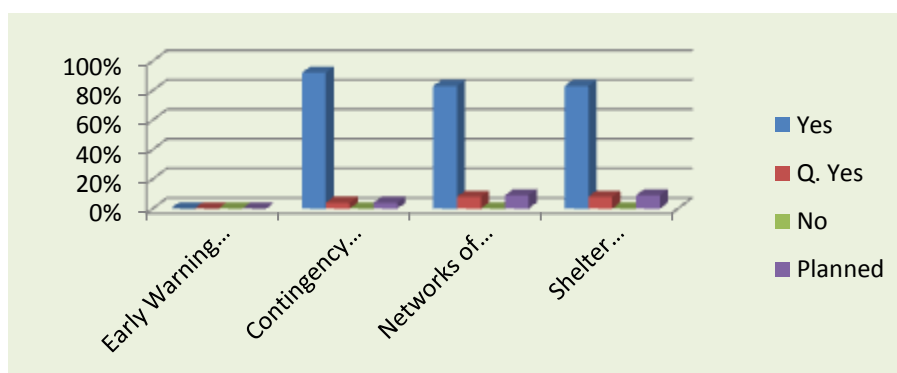


Table 14: Disaster preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	44	0	0	0	0	0	132	
Contingency Planning	35	48	2	0	2	52	105	
Networks of Emergency Responders	14	39	0	0	0	39	42	
Shelter Facilities and Evacuation Plans	26	45	4	0	5	54	78	
TOTAL QUESTIONS	119					145	357	41%
TOTAL POINTS	357	132	6	0	7			

Figure 14: Percentage scores for individual components for disaster preparedness



The **RMI_{DP}** in 2012 was 41%, i.e. a performance rating of , “average”. In 2010, it was 58%, i.e. a performance rating of “good”.

There were no responses to any of the questions for early warning and communication systems which probably brought down the RMI. On the other hand while the “yes” responses in contingency planning were just a little above 50% in 2010, the number of such responses had increased to 92% in 2012. Similarly the “yes” responses to networks of emergency responders and shelter facilities and evacuation plans were higher in 2012 - 83% respectively. In 2010, responses were only at 55% and 31% respectively.



2.8 VIRGIN ISLANDS

Described in the following sections are the analyses of capacities within the Virgin Islands in risk identification and disaster preparedness based on the information gathered, and the respective scores calculated from the B-Tool assessment.

Figure 15: Risk identification

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{RI} (%) 2012
Hazard Mapping and Assessment	36	34	2	0	0	106	108	
Vulnerability Assessment	26	19	7	0	0	71	78	
Risk Assessment	21	16	5	1	0	59	63	
Hazard Monitoring and Forecasting	22	18	3	1	0	61	66	
TOTAL QUESTIONS	105	87	17	2	0	297	315	94%

The **RMI_{RI}** for the BVI in 2012 was determined to be 94% . This is to be compared to the 73% rating that the BVI received in 2010. The performance rating for risk reduction has therefore increased from “*very good*” to “*excellent*”. There were also notable increases in the responses to questions for all the components of risk identification. Each one of these components in 2012, received performance ratings between, “*very good*” and, “*excellent*”. This significant change in status for the RMI for risk identification was a result of a combination of factors, including the R3i. The Department of Disaster Management, has over the last two years also received funding from other donors and from national budgetary allocation, including from the Governor’s office, to undertake activities in the risk identification phase. It is worthy to note that subsequent to the 2010 Assessment the Department of Disaster Management undertook a number of interventions on its own to

mitigate the gaps that had been identified in the assessment. Thus the BVI has now introduced a Bill which is now in Parliament for a second reading. This legislation will address one of the recommendations in the 2010 assessment, i.e. standards and regulations mandating preparation and publication of vulnerability assessments. Vulnerability assessments also now pay attention to women, the aged and children.

Figure 15: percentage scores for individual components for risk identification

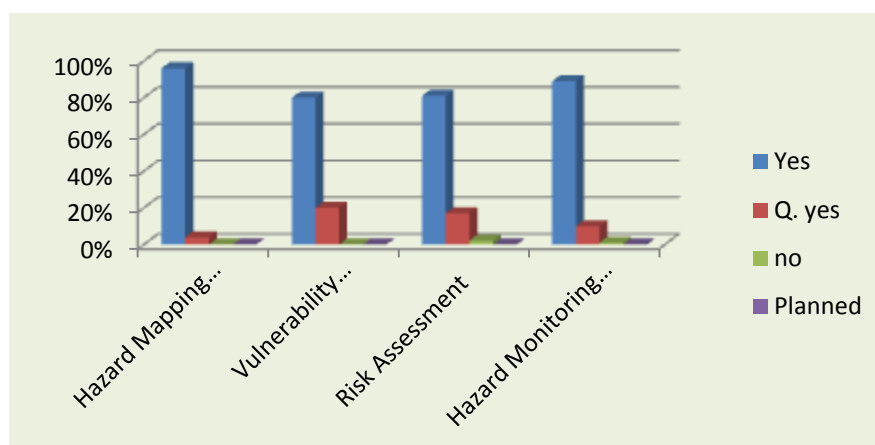


Table 16: Disaster Preparedness

	Total # of Questions	Yes	Q. Yes	No	Planned	Total Score	Maximum Score	RMI _{DP} (%) 2012
Early Warning and Communications Systems	44	37	3	4	0	117	132	
Contingency Planning	35	32	2	1	0	100	105	
Networks of Emergency Responders	14	14	0	0	0	42	42	
Shelter Facilities and Evacuation Plans	26	21	0	5	0	63	78	
TOTAL QUESTIONS	123	104	5	10	0	322	369	87%

The **RMI_{DP}** for 2012 has remained at a rating of “*excellent*”. BVI continued to score very high in early warning and communications systems. The DDM has various communication technologies which make up their Early Warning System (EWS). The DDM is now able to remotely activate the sirens; The DDM has also acquired a new digital system that allows it to modify groups, make changes to frequencies over the air and have the option for more upgrades.

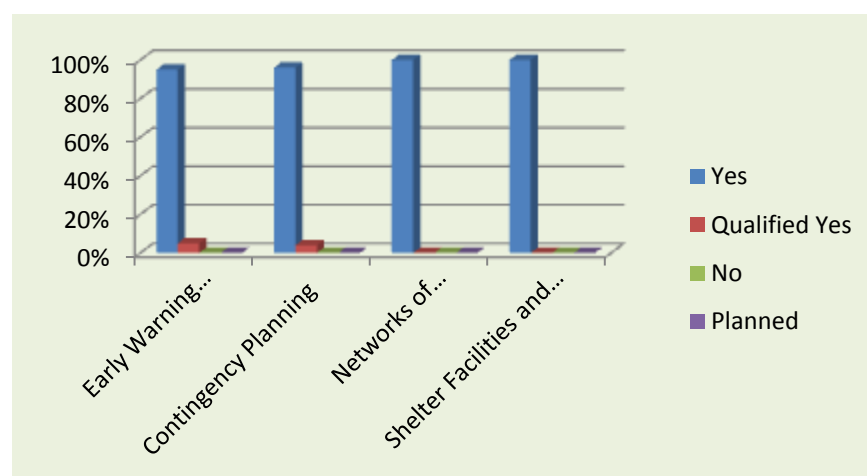
Through the R31, BVI was able to acquire Emergency Management Weather Information Network (EMWIN) system which provides real time actionable data for the DDM.

In May 2010, about 66% of the 73 government departments and agencies had a disaster contingency plan in accordance with legislation; the goal was 100% by the end of 2010. The 2012 Assessment indicated that although the 100% target had not been achieved, now 72% of the government departments have contingency plans. The Government requires quarterly reports on the status of the plans. In all there are now 32 hazard specific contingency plans. All critical facilities also have plans. Supermarkets have welfare plans; the Financial Services Unit has a Crisis Communications Plan; and all the Banks have Business Continuity Plans. The aforementioned legislation will require that all critical facilities have disaster plans.

In terms of networks of emergency responders, BVI had a very high score of close to 100%.

With respect to shelter facilities, the BVI has now established facilities to shelter boats. This was a recommendations coming out of the 2010 Assessment.

Figure 16: Percentage scores for individual component for disaster preparedness



While the DDM offers several disaster preparedness workshops to the public, and especially volunteers in shelter management, the HLSCC offers courses in shelter management and other aspects of disaster management. The college offered an-online course under output 3 of the R3i.

Although there is no signage for evacuation routes for tsunamis most people within the environs of the shelters know how to get there. Drills are held to further sensitise the general public.